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THE CHESTNUT

The American Forestry Association

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Declaration of Principles and Policy of The American Forestry Association

IT IS A VOLUNTARY organization for the inculcation and spread of a forest policy on a scale adequate for our economic needs, and any person is eligible for membership.

IT IS INDEPENDENT, has no official connection with any Federal or State department or policy, and is devoted to a public service conducive to national prosperity.

IT ASSERTS THAT forestry means the propagation and care of forests for the production of timber as a crop; protection of watersheds; utilization of non-agricultural soil; use of forests for public recreation.

IT DECLARES THAT FORESTRY is of immense importance to the people; that the census of 1913 shows our forests annually supply over one and a quarter billion dollars' worth of products; employ 735,000 people; pay $367,000,000 in wages; cover 550,000,000 acres unsuited for agriculture; regulate the distribution of water; prevent erosion of lands; and are essential to the beauty of the country and the health of the nation.

IT RECOGNIZES THAT forestry is an industry limited by economic conditions; that private owners should be aided and encouraged by investigations, demonstrations, and educational work, since they cannot be expected to practice forestry at a financial loss; that Federal and State governments should undertake scientific forestry upon national and State forest reserves for the benefit of the public.

IT WILL DEVOTE its influence and educational facilities to the development of public thought and knowledge along these practical lines.

It Will Support These Policies

Federal Administration and Management of national forests; adequate appropriations for their care and management; Federal cooperation with the States, especially in forest fire protection.

State Activity by acquirement of forest lands; organization for fire protection; encouragement of forest planting by communal and private owners; non-political departmentally independent forest organization, with liberal appropriations for these purposes.

Forest Fire Protection by Federal, State and fire protective agencies, and its encouragement and extension, individually and by cooperation; without adequate fire protection all other measures for forest crop production will fail.

Forest Planting by Federal and State governments and long-lived corporations and acquirement of waste lands for this purpose; and also planting by private owners, where profitable, and encouragement of natural regeneration.

Forest Taxation Reforms removing unjust burdens from owners of growing timber.

Closer Utilization in logging and manufacturing without loss to owners; aid to lumbermen in achieving this.

Cutting of Mature Timber where and as the domestic market demands it, except on areas maintained for park or scenic purposes, and compensation of forest owners for loss suffered through protection of watersheds, or on behalf of any public interest.

Equal Protection to the lumber industry and to public interests in legislation affecting private timberland operations, recognizing that lumbering is as legitimate and necessary as the forests themselves.

Classification by experts of lands best suited for farming and those best suited for forestry; and liberal national and State appropriations for this work.

American Forestry

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The American Chestnut Tree

By Samuel B. Detwiler

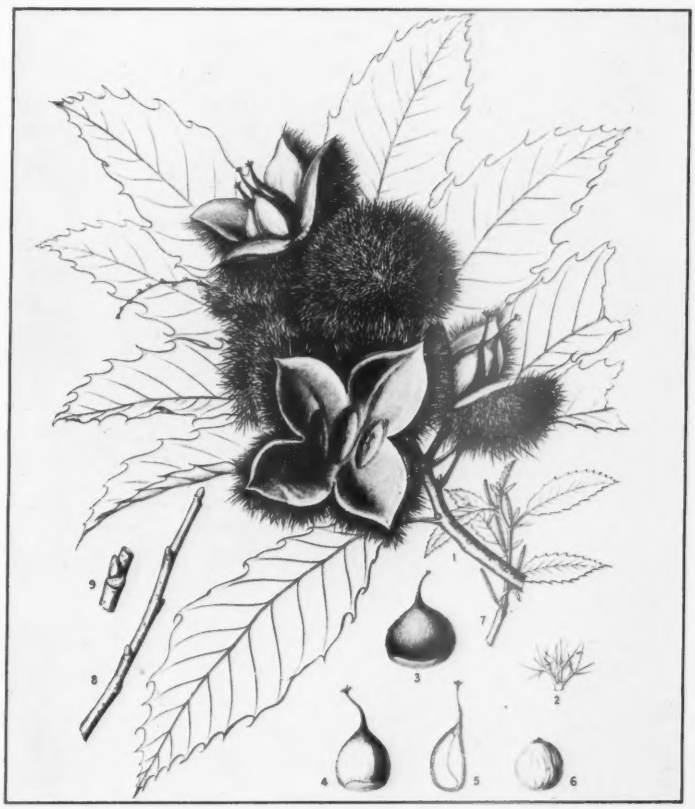
Identification and Characteristics

OUR native chestnut tree is one of our best known and best loved trees because of its beauty and utility. It grows from southeastern Maine west to southern Michigan and south to northern Virginia, southern Indiana and along the Appalachian Mountains to northern Georgia, Alabama and Mississippi. The bright foliage, attractively-shaped leaves, toothsome nuts and stately form give distinction and character to this highly valuable commercial tree of our forests.

The finest chestnut trees in the world are found in the southern Appalachian Mountains, especially in western North Carolina and eastern Tennessee. A tree with a diameter of 17 feet has been recorded from Francis Cove, North Carolina. Commonly, the mature trees are 3 to 5 feet in diameter and 60 to 90 feet in height, but there are numerous specimens 7 feet or more in diameter, 100 to 120 feet high. In Pennsylvania, New York and the New England States chestnut trees have mostly grown from stump sprouts, and are therefore comparatively small.

When growing in the forest, a chestnut tree will bear only a moderate amount of shade, and the crowding of adjoining trees causes the early death of the lower branches. For this reason forest-grown chestnut trees nearly always have long, straight, clear trunks, branching out into rather small, rounded tops. In the open the trunk is short, dividing into three or four heavy horizontal branches to form a broad, beautifully rounded head.

The chestnut has many features that distinguish it from its neighbors at every season of the year. Its grayish brown bark somewhat resembles that of the red oak because of the broad, flat, irregular ridges, but is readily known by the darker gray color, deeper fissures, and the smaller and more flaky scales of bark on the ridges. Very young trees have smooth bark. Later the ridges develop, separated by shallow fissures, and in old age these fissures become quite deep.



From "The Silva of North America" by Sargent; Houghton Mifflin Co., Publishers.

LEAF AND FRUIT OF CHESTNUT

1. Fruiting branch. 2. Spines (enlarged). 3 and 4. Nuts. 5. Vertical section of a nut. 6. Kernel of nut or seed. 7. End of young twig with new leaves and undeveloped flowers. 8. Winter branch. 9. Bud and leaf scar.

The buds are one of the best means of identifying this tree in winter. They are dark brown, about one-quarter inch long, egg-shaped but usually sharply pointed. The buds stand singly on strong-growing branches. Every fifth bud stands directly above the one from which counting begins, and if a string is drawn from bud to bud it will form a spiral, passing twice around the branch from the first bud to the fifth one.

After most of the trees have well developed foliage, but be-

fore the oaks have put forth their leaves, the chestnut buds open and the tiny leaves unroll. Though inconspicuous, there is grace and beauty in the artistic symmetry and delicate coloring of the baby leaves—rose, yellow and exquisite shades of green. On short branches that bear the fruit, the leaves form a leafy star, giving variety to the appearance of the foliage.

In form the leaves are slightly like those of the beech. They are six to eight inches long and about two inches wide, wedge-shaped at the base and tapering to a sharp point. The margins are coarsely toothed and the veins prominent and regular. The "ant cows" (plant lice) love to feed along the veins on the lower surfaces of the chestnut leaves. In the Fall the leaves assume soft shades of yellow and red, but soon lose their brilliancy.

BARK OF THE CHESTNUT TREE

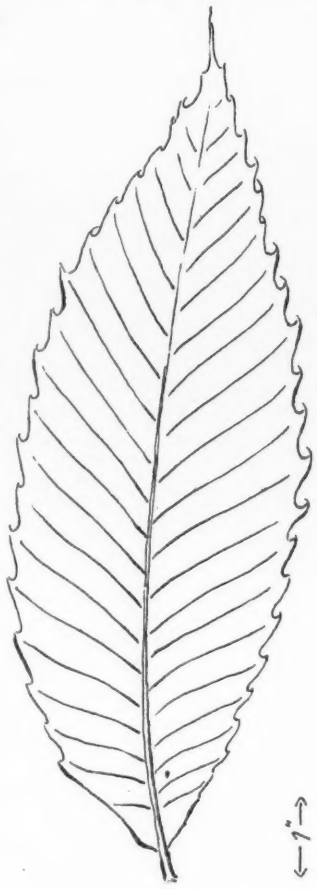
The grayish-brown bark somewhat resembles that of the red oak because of the broad, flat, irregular ridges, but is readily known by the darker gray color, deeper fissures and the smaller and more flaky scales of bark on the ridges. Very young trees have smooth bark.

Early in July the chestnut tree becomes one of the most striking features of the landscape. Long after other trees have bloomed, it suddenly blazes into a wealth of odorous, cream-colored blossoms. These are the clustered catkins of the pollen-producing flowers. The flowers that produce the nuts are separate from the others and much less noticeable, because they consist of small spikes with a few green, scaly blossoms. These two kinds of blooms do not usually appear at the same time on one tree. The wind carries the pollen from tree to tree and thus effects cross-pollenation.

Two or three, or sometimes only one, of the nut-producing flowers are fertilized and grow into prickly burs. At first the young burs are very small, but by the middle of August they are full-sized. The sharp spines which make the bur a sort of vegetable porcupine are Nature's protection against injury to the sweet nuts until they are fully ripe. The Indians called the chestnut tree "O-heh-yah-tah"—"the prickly bur." The first heavy frost of Autumn causes the bur to separate into four parts, disclosing two to four shining nuts resting in a bed of soft brown velvet.

Chestnut trees do not grow well if the soil around their roots is disturbed, as is shown, in regions where blight is not prevalent, by the dead tops of many trees in closely grazed pastures and on the road sides. They are easily injured by fire and have many insect enemies. Various species of borers injure the bark, the wood is very apt to be perforated by small worm holes, the foliage is frequently injured or destroyed by leaf rollers and leaf-eating insects, and the nuts are often infested with the chestnut weevil.

The most serious enemy of the chestnut tree and one that apparently means its ultimate extinction in this country is the chestnut bark disease or "chestnut blight." All species of chestnut and the chinquapin are susceptible in varying degrees to the bark disease. The chestnut bark disease was brought to this country from China or Japan, and the Chinese and Japanese chestnuts are highly resistant. The chinquapin is slightly resistant, but the American and European species of chestnut have thus far shown no power to withstand the disease.



CHESTNUT TREE LEAF

The leaves are six to eight inches long and about two inches wide, wedge-shaped at the base and tapering to a point. The margins are coarsely toothed and the veins are prominent and regular.

Although comparatively little has been heard about the chestnut blight in the past two or three years, there it no evidence that it is progressing more slowly or that it is less virulent than formerly. The bark disease is generally prevalent from Maryland to Connecticut, as far west as the mountains, and scattered infections occur as far west as east-

ern Ohio and eastern West Virginia, and in southern Virginia and North Carolina.

The chestnut tree is noted for rapidity of growth and and for its ability to sprout freely. The rate of growth varies with the conditions under which it grows. An average growth in diameter is about one inch in three years. Under normal conditions the chestnut tree lives to a great age. It grows on a great variety of soils, but does best on porous soils of moderate depth and fertility. It is well suited with rocky hillsides and gravelly

CHESTNUT TREE IN WINTER

Trees may be identified in winter when they have lost their leaves by the general contour of the branches and by the bark. The student will do well to study them so thoroughly that it becomes easy to identify them at any time of the year.

or even sandy soils, but it is seldom found on limestone soils.

The chestnut produces great numbers of vigorous sprouts from the stumps of young and middle-aged trees. These sprouts grow more rapidly than seedlings during the first thirty years of their life, and in the past, because of this valuable characteristic, the chestnut has been one of the most profitable trees in the farmer's woodlot. It is easily grown from seed but natural seedling growth is usually not abundant because the nuts are so highly prized for food by squirrels, mice and other animals, as well as human beings. In view of the relentless destruc-

Photo by Edith R. Mosher, U. S. Forest Service.

CHESTNUT TREE IN BLOOM

Long after other trees have bloomed, the chestnut, early in July, suddenly blazes into a wealth of odorous, cream-colored blossoms and becomes one of the most striking features of the landscape. These blossoms are the clustered catkins of the pollen producing flowers.

tion of the chestnut by the bark disease and its many other enemies, the planting of this species is not advisable.

The wood of the chestnut is of a brownish color, light in weight, coarse grained, fairly soft, of medium strength, easily worked, and the grain has a pleasing pattern. It is durable in contact with the soil, on account of the high tannic content, which ranges from five or six per cent in young trees to ten to fourteen per cent in very old trees. The wood has a great variety of uses.

The nuts of our native chestnut are superior to the European and Japanese species, and to a less extent, to the Chinese. Chestnuts are an important article of food in Italy and some other foreign countries. They are

Courtesy of Manual Arts Press.

AREA OF CHESTNUT GROWTH

This map shows the general range of the chestnut, which is confined to the States east of the Mississippi.

made into flour from which bread is made. They are also served for food in a variety of other forms and possess a high nutritive value.

There are a number of varieties of cultivated chestnuts mostly derived from the European chestnut. Until the advent of the blight, chestnut orchards for the production of nut crops offered a source of revenue from waste land. Chestnut orchard trees must be grafted, as varieties do not come true from seed.

The chinquapin is the chestnut's nearest relative, native to this country, that assumes tree form. It is usually a shrub and the leaves and burs cause it to resemble a chestnut in miniature. The nuts are small and shaped like an acorn, but are very sweet and delicately flavored. It is possible that a variety of chestnut immune to the bark disease may be bred by crossing the Japanese or China species with the chinquapin, creating a variety superior to any which now exists.

Commercial Uses of Chestnut

By P. L. Buttrick

MOST people if asked to name the leading hardwood tree of the United States would probably say, "oak." But that is really no answer for oak is not the name of a single kind of tree, but of many. There are about sixty species of oak in the United States, many of which are of economic importance and help to make up the total cut of that wood

Courtesy Manual Arts Press.

ENLARGED CROSS-SECTION OF CHESTNUT WOOD

Line of demarcation between two annual rings of growth distinctly shown. That portion with small pores and constituting lower one-fourth of picture is summer wood of one annual ring, while the upper three-fourths of picture with large pores is the spring wood of the next succeeding annual ring.

which in 1910 was three billion feet. The next highest name is maple which has a total cut of one billion feet, but maple, like oak, is a generic name and covers many different trees. Yellow poplar, better known as the tulip tree to most people, has a cut of about seven hundred million. Red gum and chestnut follow with about six hundred million each. If we include the vast amount of chestnut which is cut for shingles, telephone and telegraph poles, railroad ties, piles, fence posts, mine props and cordwood for the manufacture of tannic acid and paper pulp, none of which are included in the six hundred million feet of lumber, it is probably safe to say that chestnut has the largest cut of any single species of hardwood in America, for no such enormous amount of material not sawed into lumber is cut from any of the other hardwoods mentioned. Aside from the amount of its cut, it is certainly fair to consider chestnut as one of the leading hardwoods of America.

It also has other distinctions, one being a universal name, something of which few trees can boast. A chestnut tree is always a chestnut tree no matter where it grows. Contrast this with such a tree as the longleaf pine, surely a distinctive enough tree for a distinctive name, yet it has twenty-seven recognized ones. Even our old standby, the white pine, is occasionally found masquerading as the Weymouth pine. Chestnut has even given its name to other trees. We have a chestnut oak and a horse chestnut. The first was named because of the resemblance of its leaves to its namesake, the second because its fruits resemble to a degree those of the true chestnut.

It is most numerous and important in the Southern Appalachian Mountains, where in the State of North Carolina it forms 27 per cent of the total stand, and is the most numerous tree in the forest, occasionally forming almost pure stands, although generally growing in mixture with other hardwoods such as oaks and tulip poplars. Conditions are much the same in eastern Tennessee and southwestern Virginia. In these States most of the stand is composed of virgin timber, but outside of the Appalachians, most of the chestnut is second growth and is apt to be composed of sprouts from old stumps, often several generations having grown up and been cut from the original seedling stump. Here as elsewhere chestnut is apt to have, for its companions, various of the oaks.

No reliable estimate has ever been made of the total stand of chestnut in the United States. It is doubtful if it exceeds 30,000,000,000 feet and is probably nearer 20,000,000,000. The bulk of the supply, as might be expected, is in the Southern Appalachians. North Carolina alone has a stand of 3,375,000,000 feet. Kentucky is estimated to have between 3 and 4 billion feet. It it doubt-

ful if any of the other States in the Southern Appalachian have stands exceeding 4,000,000,000 feet, and no State outside that region with the possible exception of Pennsylvania would come anywhere near that amount.

It is difficult to say how the amount of chestnut compares with that of other hardwoods. It is certainly less abundant than all the oaks grouped together, but may surpass any of them alone. There is without doubt much more of it than of yellow poplar, or any of the higher priced hardwoods such as cherry and walnut. Beyond that it would be unwise to venture, since the other important hardwoods do not generally occur in the same region as chestnut and we have therefore no standard of comparison.

CHARACTER AND USES OF THE WOOD

The heartwood of chestnut is light brown in color, while its sapwood is yellowish or whitish. Chestnut belongs in the same plant family as the oaks, yet its wood

Courtesy Penna. Chestnut Blight Commission.

CHESTNUT FOR RAILROAD CROSS-TIES

Chestnut stands fifth in the list of woods used for railroad ties. These ties are usually gotten out of woodlots by farmers and small dealers and sold to the nearest railroad.

can be easily distinguished from them by the apparent absence of medullary rays, which are those markings that give such a pleasing appearance to quartered oak. These rays are of course present in chestnut but are very inconspicuous. Chestnut is neither a very strong nor a very hard wood, not nearly so strong or hard as oak, but it is very even grained and durable. It will outlast almost all the oaks and most other hardwoods, its durability being due to the high percentage of tannin which it contains. It is light in weight and easily worked and does not warp readily. A cubic foot of absolutely dry chestnut wood weighs 28.07 pounds. The same amount of white oak weighs 46.35 pounds, of red oak 40.76 pounds, of white pine 24.02 pounds, of longleaf pine 43.60 pounds, of yellow poplar 26.36 pounds, of basswood 28.20 pounds, red spruce 28.57 pounds. This places chestnut in the class of light weight woods, and since railroad freight rates on lumber are based on weight rather than board measure, this gives it an advantage in marketing over many of its heavier competitors. A table of shipping weights gives dry chestnut as weighing 2800 pounds per 1,000 board feet. Tulip poplar and the tulepo are given the same; basswood and butternut, the latter an unimportant wood, are given as 2,500. All other hardwoods are higher.

This lightness, freedom from warping, durability and reasonable strength, and the high percentage of valuable chemical substances which it contains, together with its great abundance have given chestnut a greater variety of uses than almost any other American hardwood. It

CHESTNUT BOARDS

Both of these are tangential or bastard cut and show the attractive grain often found in the wood.

touches almost every phase of our existence. It serves as a shade and ornamental tree on our parks and estates. Its wood is used in the building and decoration of our houses and the manufacture of our furniture. We sit down in chairs made of chestnut and transact our business at desks, ostensibly of oak, but generally of chestnut veneered with oak, we receive messages from the distance over wires strung on chestnut poles. We sit in a railroad train and read newspapers into whose composition chestnut pulp has gone, while our train travels over rails supported on chestnut ties and over trestles built of chestnut piles, along a track whose right-of-way is fenced by wire supported on chestnut posts. On the

Courtesy Penna. Chestnut Blight Commission.

A CHESTNUT SHINGLE MILL

While seventh on the list of woods used for shingles, chestnut is the leading hardwood used for that purpose, its nearest competitor being oak. Shingles made from it are very durable and weather to an attractive shade. These shingles sell locally for from $2.50 to $3.75 a thousand.

same train travel goods shipped in boxes and barrels made of chestnut boards and staves. Even the leather for our shoes is tanned in an extract made from chestnut wood. In the Fall we munch hot roasted chestnuts and many housewives feel that they are a necessary part of dressings of various kinds. At last when the tree can serve us no longer in any other way it forms the basic wood onto which oak and other woods are veneered to make our coffins.

ITS EARLY HISTORY

The early settlers encountered chestnut pretty well up and down the eastern coast of the United States, and when food was scarce, if we are to believe our school histories, they were glad to make use of its succulent nuts as a serious part of their diet, even as did the Indians. Surrounded as they were by an unsurpassed wealth of timber, far in excess of their immediate needs, the earliest colonists were able to pick and choose, taking only the best and finest for their homes, using the rest for fencing and fuel, or burning it to rid the fields of its presence. In early New England white pine was the chief building material. Later when the local pine was exhausted it was necessary to fall back upon native hardwoods. Oak and chestnut then began to be used and many Revolutionary and early nineteenth century houses were built of hewn oak and chestnut frames, oak floors, and chestnut sidings and shingles. Later the opening up of the virgin pineries of northern New York, Pennsylvania and the Lake States flooded the country with white pine and local woods ceased to be so largely used for building, particularly in the cities, but country houses and barns are even yet frequently framed of local hardwood timbers, and one does not have to go back many years to find barns built of heavy hand-hewn chestnut beams put together with wooden pins. Building of such construction will outlast the modern framed buildings built of lighter materials and put together with nails. In the Appalachian Mountains, even as far north as Pennsylvania, to this day log cabins are built of chestnut logs, sometimes in the round, sometimes hewn square.

The earliest use of chestnut still remains one of its important ones, for chestnut has been a fencing wood since Colonial times. Few woods split lengthwise easier and straighter than chestnut, or are lighter or more durable. Fence rails made of it will last a life time. The early settlers built their fences of chestnut rails,

Courtesy Penna. Chestnut Blight Commission.

CHESTNUT FOR TELEPHONE AND TELEGRAPH POLES

Next to cedar, chestnut is the leading wood for poles in the total amount used annually. When the advent of the telephone and telegraph created a demand for poles it did not take long before the value of the chestnut was realized and east of the Mississippi it outranks all other woods for this purpose.

piling them in the familiar snake or zigzag fashion. This form of fence, often called the Virginia rail fence, requires no posts. All that is needed to build one is an ax, plenty of rail timber, and the ability to work. The early settlers had all three. Later in the north a form of fence came into use in which the rails were mortised into the posts set in the ground. The advent of barbed and woven wire has banished both forms of rail fence in all save the most remote districts. But it has not interfered with the supremacy of chestnut as a fencing wood, for wire must be stretched upon posts. There are woods which make better fence posts than chestnut—red cedar, black locust and osage orange, for instance—but none of them are so widely distributed or universally abundant as chestnut, and thousands of chestnut posts are set annually. Some are sawed, some used in the round, some split out roughly, and some carefully turned to an even taper or an ornamental form. Posts of larger size are frequently used for the foundation of shore cottages and other buildings which are built without cellars. They are not as lasting as cedar, but are easier to obtain in large dimensions, and sufficiently durable.

The advent of the telegraph and telephone created a demand for large poles. At first, apparently, many woods were used indiscriminately, but for a long time the value of chestnut for this use as well as for trolley and electric light poles has been fully realized. Taking the country as a whole, cedar is the chief pole wood, but east of the Mississippi, where chestnut is available in large quantities, it outranks all other woods used for the purpose, and even taking the United States as a whole, 20 per cent of the poles used are chestnut. The reason for its popularity are: its convenient form, tall, straight and slender; its durability; its lightness and its abundance. A 30-foot chestnut pole, 25 inches in circumference at the top, if seasoned, would weigh about 1,000 pounds. A white oak pole of the same dimensions would weigh about 1,700 pounds and would be but little if any more lasting, but would cost much more. Along the sea coast there is considerable demand for piles for docks, trestles, cribwork and the like. Chestnut trees of the proper dimensions, but not straight enough for poles, can often be used in this way.

When white oak and locust began to become too valuable to be used indiscriminately as a tie wood, the railroads of the east adopted chestnut as one of their leading woods for this purpose. It was almost as durable as the other woods and much more abundant, but as traffic began to increase and heavier rails and train equipment began to be used it became evident that chestnut, because of its softness, would not stand up to heavy traffic conditions on main lines, and as the use of ties treated with chemical preservatives increased it was found impossible satisfactorily to treat chestnut. For these reasons it has now been largely relegated to use on light traffic branch lines and trolley roads. Nevertheless, it still remains the leading tie-producing wood of New England and the Eastern States. The second growth chestnut of the North is apt to be harder and heavier than

Photo by P. L. Buttrick

CHESTNUT FENCE POSTS

Chestnut, because of its abundance and lasting qualities when in contact with the soil, is one of our leading fencing woods. The advent of barbed wire has decreased the use of rails, but the demand for posts continues. Posts are used in the round, split out, sawed or turned to fancy patterns.

HEWING OUT CHESTNUT RAILROAD TIES

Chestnut is one of the leading tie woods of the United States. It is very durable, but because of its softness it wears out under heavy traffic before it rots. Chestnut sprouts from the North make better ties than the slower growing seedlings of the South.

that from the slower growing virgin trees of the South and consequently makes better ties.

The early settlers soon learned that chestnut did not make very desirable firewood, and their descendants have not forgotten the fact. Dry chestnut burns easily and quickly, but it snaps and crackles, throwing out sparks profusely. This makes it undesirable for the fireplace. Yet it is one of the best of hardwoods for kindling, since it splits easily and ignites quickly. Old chestnut rails, posts, etc., frequently find an end to their usefulness as kindling wood. Sometimes chestnut is used in rural dis-

Photo by P. L. Buttrick.

CHESTNUT CORDWOOD USED AS A SOURCE OF TANNIC ACID

Chestnut does not make good firewood, but it is rich in tannic acid and in the South the farmers cut and haul it to the railroads for shipment to the plants where the acid is extracted.

tricts, where the gas range is not, as "summer wood." The fact that it ignites and burns quickly renders it desirable when a light, quick fire is wanted.

CHESTNUT WOOD AS A SOURCE OF TANNIC ACID

Chestnut cordwood, however, has other uses than its rather precarious one of domestic fuel. It is occasionally used in brick ovens, and for annealing brass, but by far the largest use is as a source of tannic acid, for chestnut wood is rich in that substance. Its tannin content averages more than 8 per cent, occasionally running as high as 12 per cent. Hemlock and chestnut oak barks, formerly the chief source of the substance, run somewhat higher, but their wood does not contain enough tannin to pay for its extraction. Over two-thirds of all the tannic acid produced in the United States is now extracted from chestnut wood and bark.

It is used in the manufacture of leather and the dyeing of silk. In the first case, the acid combines with the albumens of the raw hides to form leather, and in the second, the various coloring matters which all vegetable tannins contain act as a dye on the silk fabrics. Although the tannins from the various woods and barks are all alike chemically, they differ in their action upon the hides because of the various other organic substances and coloring matters which they always contain. The tannin derived from chestnut oak bark is said to give the best results, both in body and color, for sole leathers. Hemlock does not impart such a good color and is used for the less expensive leathers. Chestnut is largely used in mixture with oak tannin for the preparation of leathers of medium grade.

The industry of extracting tannic acid from chestnut wood is largely confined to the South. Chestnut grown north of southern Pennsylvania does not contain a high enough percentage of tannin to make its extraction profitable. The industry centers in southwestern Virginia, western North Carolina and eastern Tennessee, where some twenty plants, with a combined product of perhaps 1,000 barrels of extract per day, are at work. The process is very simple. The cordwood is ground up into small chips, placed in tanks and leached out by hot water. The product is then evaporated to dryness or the required degree of concentration. Although cordwood is gener-

Photo by North Carolina Geological and Economic Survey.

INTERIOR OF A TANNIC ACID EXTRACTING PLANT

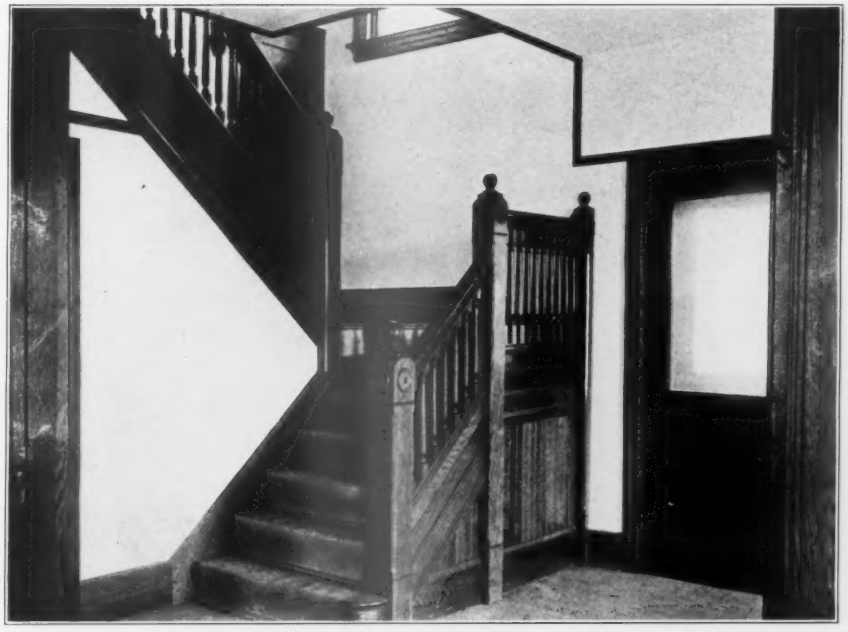
Chips of the chestnut wood are placed in the tanks, the tops of which are shown here. Hot water is then added which leaches out the acid. The foam is caused by the boiling of the solution. Tannic acid is used in the manufacture of leather.

ally used, sawmill waste is sometimes employed. Wood from dead timber is more in demand than from live, and some of the plants in North Carolina run almost entirely on wood cut from the numerous dead trees standing along the eastern slope of the Blue Ridge. About 100,000 long cords of chestnut wood per annum are used in this industry in North Carolina alone, while Tennessee uses about half that amount, and the total production is reported to be about 250,000 standard cords per annum.

A few paper pulp plants in the South use chestnut in the manufacture of their product. The plant which uses probably the largest amount of this wood for the purpose has or had a contract to supply the Government with the paper for its postal cards. The tannic acid is first extracted from the wood in the manner described above and chips are then reduced to pulp by the soda process. The chief objection to chestnut seems to be its

color. The pulp must be bleached to a greater extent than that made from lighter colored woods, which fact increases the cost of production, but in view of the great abundance of the wood and its cheapness it is not probable that this objection will greatly weigh against its use.

All the uses to which chestnut is put that we have so far mentioned may be called rough uses. It does not necessarily require a sawmill to manufacture railroad ties, telephone poles, fence posts and cordwood. They are largely gotten out of the woods and sold by farmers and small dealers. There is hardly a New England or Middle States farmer who does not cut ties, poles, and posts from his woodlot in the winter when regular farm work is slack. In parts of the South, farmers regularly depend for a part of their income from the revenue derived from selling chestnut cordwood to the tannic acid and pulp plants of the section. There is no other tree which contributes so many rough products to our modern life, nor in such amounts. Yet the amount of it sawed into lumber entitles it to fifth, practically to fourth, place among all hardwoods or groups of hardwoods cut in this country.



Courtesy Penna. Chestnut Blight Commission.

CHESTNUT USED AS INTERIOR TRIM

Chestnut is used for house construction, both in the interior and exterior. It is desirable for trim, casing, etc., in plastered houses, and for ceiling and siding in houses where plaster is not used. It takes paint well and finishes attractively in the natural wood, but is too soft for flooring or for other places where there is excessive wear.

CHESTNUT LUMBER

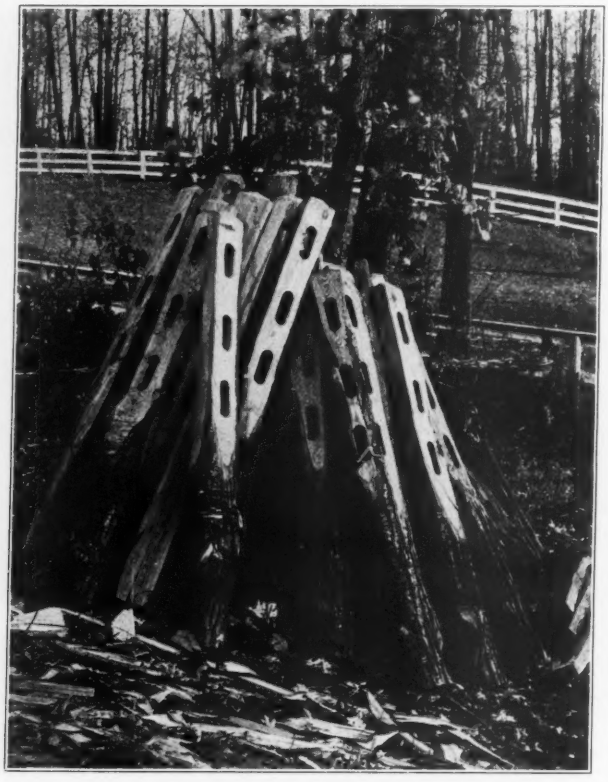
Chestnut lumber is used for house construction, both interior and exterior. For interior work it is used both for trim, casing, etc., in plastered houses and for ceiling and siding in buildings where plaster is not used. It takes paint well and finishes attractively in the natural wood, but is too soft for flooring or for other places where there is excessive wear. Its local uses for dimension materials has already been touched upon. Yet in spite of its many uses for building and construction it is much more in demand for house furnishing than house building. It is, in fact, one of our leading furniture woods, quite probably surpassing any one of the oaks in volume used, yet, with the exception of panels in wooden bedsteads, kitchen furniture and the less expensive chairs, bureaus and tables, we see little furniture finished in chestnut. Its great use comes as a core stock for veneers, for most of our furniture, even the better grades, is veneered. Tables, desks, bureaus, cabinets and the like are often made of chestnut and covered with thin veneers of oak, maple, cherry, walnut or expensive tropical woods such as mahogany or rosewood. The essential wood of pianos is frequently chestnut, onto which other woods are veneered. Sometimes furniture made of more desirable woods where it will show is of chestnut elsewhere. This is particularly true of bureaus.

There are two reasons for the popularity of chestnut in the furniture industry. First, it is abundant, light, holds its shape well, does not warp, is not affected by moisture, and can be obtained in wide widths. This makes it desirable for use by itself. Second, its open, porous structure, combined with freedom from knots, pitch or blemishes, and the frequent presence of numerous small holes, called pin holes, or shot holes, caused by a boring insect, known as the chestnut timber worm, enable the glue which binds the core to veneer to take a good grip, in addition to the other qualities mentioned before, makes it the leading wood for veneer cores. A special grade of chestnut called "sound wormy" is used for this purpose and is in much demand. Chestnut also has a special advantage when used with oak in that its similar color and superficial resemblance in plain section enable it to be finished on sides and ends of tables, desks, etc., whose tops are veneered with oak.

Coffins are hardly to be classed as furniture, yet they are made of much the same woods, and the process of manufacture is quite similar to that of many more cheerful articles. The coffin manufacturers probably use more chestnut than any other wood. It is used solid in coffins and coffin boxes of the less expensive grades, and as a backing for veneered coffins of higher price.

A glance over previous sheets reveals the fact that we have failed to mention chestnut as a shingle wood. Most of our shingles are of soft wood; western red cedar, northern white cedar, cypress, yellow pine, hemlock and

white pine are the leaders. Chestnut is seventh on the list, but it is the leading hardwood, its nearest competitor being oak. In 1909 91,766,000 chestnut shingles were manufactured, which was three times that of all the oaks combined. No other hardwood was important enough for mention. The above figure presumably does not include the large number of hand-made chestnut shingles made in the Southern Appalachians. Chestnut shingles are very durable and weather to an attractive shade. Their chief disadvantage seems to be that the tannin in the wood leaches out and in time rusts the nails with which they are layed. It is also hard to get



Courtesy Penna. Chestnut Blight Commission.

MORTISED CHESTNUT FENCE POSTS

A great deal of the blight-killed chestnut of Pennsylvania and adjoining States is being used for this purpose.

much chestnut shingle stock free from the worm holes previously mentioned, and these cause them to leak. It seems as though it ought to be possible to work up a market for chestnut shingles to be used as side shingles on cottages and suburban residences. Their attractive gray color when weathered is as pleasing as white cedar, and the supply is unlimited. The use of galvanized nails should overcome one difficulty, and leakage through the worm holes would not be important if shingles were laid on sides instead of roofs. Chestnut shingles sell locally for from $2.50 to $3.75 per thousand.

GRADES AND PRICES

Chestnut lumber is divided into two groups according to whether or not it contains worm holes, since they are liable to be found in wood of almost any quality. While these worm holes lower the grade, the wood itself is otherwise unaffected, so that the wormy material is itself divided into the same grades as the non-wormy. A list of the grades and the wholesale prices per thousand feet board measure for lumber produced at representative southern mills for the first half of 1913 (when lumber prices were more normal than at this writing) is as follows:

Firsts and seconds 4/4	$43.40
No. 1 common 4/4	29.40
No. 2 common and sound wormy 4/4	13.20
No. 3 common 4/4	10.00

The prices prevailing at the mills in the early part of 1913 for the various grades into which sound wormy is sometimes divided were as follows:

Firsts and seconds 4/4	$17.00
Quarter sawed 4/4	16.50
No. 1 common and better 4/4	14.00
No. 2 common 4/4	10.50
No. 3 common 4/4	8.50

At times sound wormy has averaged as high as $18.00 per thousand. The average mill run price at southern mills at the period of the above quotations was $16.50. Chestnut from the southern mills generally commands higher prices than that produced by portable mills from the woodlots of the North, chiefly because of its superior manufacture and grading.

The ten leading States in production are West Virginia, Pennsylvania, Connecticut, Tennessee, Virginia, North Carolina, Kentucky, Maryland, Massachusetts, New York. With the exception of Connecticut and Pennsylvania, the leaders are all in the Southern Appalachians, where over 55 per cent of the total was produced.

Despite its present supremacy, chestnut was long unrecognized as an important producer of lumber. The old lumbermen of the Appalachians took only the poplar and the cream of the oak and basswood, but now operators are going back over the old cuttings and taking the chestnut along with the rest of the other trees.

CHESTNUT AS A NUT TREE

Chestnuts whether roasted or in turkey dressing require no introduction. There are no statistics to show how many bushels of chestnuts are marketed every fall, but one has only to visit the produce houses in our large cities at the proper season—or, better still, the country stores and express offices in the small towns in the Appalachian Mountains—to realize that it is large indeed, for the bulk of the nuts on the market come from these mountains. With the first frost, the women and children seek the woods to collect the freshly fallen nuts, taking them to the country stores, where they are sold or exchanged for other commodities. The storekeepers ship them to market as speedily as possible, for there is always a rush to get the earliest nuts in, since they command the highest prices. As high as $3.00 per bushel is sometimes paid for the first arrivals. Later the price may drop to almost nothing when the market will absorb no more, but as winter approaches it rises again. Realizing the value of the nuts, some of the mountaineer farmers have selected suitable tracts of chestnut growth on

favored situations, and thinned out the trees so as to develop specimens with large crowns, which results in increased nut production. These places are locally called chestnut orchards. There have been in various parts of the country, notably Pennsylvania, from time to time regular chestnut orchards established for growing chestnuts, but most of them have made use of horticultural varieties of the various European or other exotic chestnuts, since their nuts are larger than those of our native tree. In some cases, however, this exotic stock has been grafted onto our native trees. The coming of the chestnut blight put a summary end to the productivity of most of these orchards. Experiments in spraying and hybridizing different species of chestnuts valuable for nut production to produce a blight-resistant form may, if successful, allow these orchards to be re-established.

Courtesy Penna. Chestnut Blight Commission.

CUTTING SLACK STAVES FROM CHESTNUT STAVE BOLTS

Chestnut is one of the five leading woods used in the slack stave industry.

Chestnut in the Future

ASIDE from its value for all sorts of uses, chestnut was long regarded as a valuable woodlot tree, because of many of its other qualities. A tree to succeed in the average farm woodlot must be quick growing, and chestnut is easily that; there are few hardwoods in its range which grow faster. In the South chestnut sprouts frequently attain fence-post size in 10 or 15 years, and tie size in 25 years. In the North farmers used to be able to depend on obtaining ties from chestnut trees 35 or 40 years old. Another fact which gave the tree such a value in the woodlot was the prolificness with which it sprouted. If you cut down a chestnut tree, you get many chestnut trees in its place, for, unless the tree is very old, a large number of sprouts spring up from the stump and grow like weeds, in a few years forming a group of thrifty young trees. In New England and the Middle States farmers took advantage of this sprouting capacity, which is possessed to a lesser degree by the other hardwoods of the region, and cleared off their woodlots every 30 or 40 years, trusting to the sprouts to grow up and form a new stand. It was a rough application of the well-known forestry system known as the *simple coppice* system.

The combination of desirability for many uses, particularly those not requiring extensive manufacture, together with its rapid growth, have made chestnut the leading woodlot tree of the Northeast. When foresters began to study woodlot conditions, they discovered much about the chestnut which the farmers already knew, and they advocated not only favoring the tree in the woodlot, but its extension, and many chestnut plantations were made as a result of their advice.

But its popularity was short lived, for today, notwithstanding all its good points, it is no longer upon the forester's list of desirable trees, and, far from encouraging it, he is advocating its removal from the woodlot as speedily as possible. Enemies now attack this tree on every side, and it is very poor forestry to favor a tree against which nature has so definitely set her hand. The chestnut has been practically exterminated over whole sections where formerly it was common, and in many others it is now being destroyed by the wholesale. Its enemies bid fair to destroy it as a commercial tree, perhaps to push it to the borders of extinction.

One of these enemies has risen with almost drastic suddenness. Less than fifteen years ago the chestnut blight was unknown to the scientist or the woodsman. Seven years after the discovery, in 1904, near New York City, of this undesirable alien from northern China it was conservatively estimated to have done $25,000,000 worth of damage. At present it is found from Maine to North Carolina, and it is thought that it will all but exterminate the chestnut in the Northern States, where already it has destroyed its commercial value in many places, and may invade the South with like disastrous results. At a recent meeting of the lumbermen of southern New England it was the concensus of opinion that ten years or less will see the end of chestnut as a com-

Photo by P. L. Buttrick.

UTILIZATION OF CHESTNUT

This Southern Appalachian farmhouse is built entirely of chestnut. Everything except the boards over the windows and at the gables is hand hewn—side boards, rafters, shingles and floor boards. The rail fences in the background are built of chestnut posts and rails. Even the poles supporting the haycock are chestnut. All the material was cut from the forest growing close by.

mercial species in that section, for no way has been found to definitely check its ravages, although the National Government and some of the States have spent large sums in the attempt.

So the forester is recommending the removal of all chestnut of commercial value in the region of blight infestation in order that it may be marketed before it is destroyed, for dead chestnut deteriorates rapidly in value. At the same time the removal of much of the chestnut may help to check the rapid spread of the disease.

The other enemies of the chestnut have confined their attacks largely to the southern portion of its range. They have been at work much longer than the blight and have in the aggregate caused a much greater damage, but their ravages spread less rapidly, and have not been as fully discussed or studied. In fact, there is much that we do not know about them. There seems to be a combination of insects, fungous diseases and fire, or perhaps something more deep seated, such as a widespread but obscure soil or climatic change, of which the others are but manifestations or subordinate causes, destroying the chestnut in the South. The trees generally die in midsummer and, unlike blight-killed trees, seldom sprout from the stump after the trunk is killed. Certain insects, notably the two-lined chestnut borer (*Agrilus bilineatus*), are almost always found under the bark of the dead or dying trees, but whether as cause or effect has sometimes been a matter of dispute.

Formerly chestnut grew pretty well over the entire South, east of the Mississippi River and north of Florida. But about seventy-five years ago it began mysteriously to die out throughout the lowland portions of the region and today it is a disappearing straggler of no commercial importance everywhere except in the mountains, its former abundance being attested by old stumps, rotting logs, weathered fence rails, and the tales of the old inhabitants. Even in its Appalachian stronghold, where it reaches its greatest development and abundance, this strange dying off is going on in a few sections. At this time it is particularly active along the lower slope of the eastern side of the Blue Ridge, where whole mountain-sides are covered with gaunt white trunks of trees killed within the last few years.

Thirty years or less at the present rate of cutting will exhaust the supply of virgin chestnut timber in the Southern Appalachians, and outside of that region there is little to fall back upon save the second growth from such scattered woodlots as have escaped destruction. If the blight and the other agents of destruction continue their devastation, it looks as though within our lifetime the chestnut will have to be added to that melancholy list of American plants and animals, like the buffalo and the black walnut tree, of which we say "formerly common, now rare."

ALASKA'S FIRE LOSSES

CHIEF FORESTER H. S. GRAVES, on his return to Seattle from Alaska recently, was quoted by a newspaper as saying that enormous damage has been done in Alaskan forests by fire. Mr. Graves said: "The great interior river systems were originally wooded. I would estimate that in the last fifteen years there have been burned not less than a million acres a year.

"This summer, which was unusually dry, the total loss is one or two times the average. Yet the government is not taking a single step to protect these forests.

"In August I passed through more than 100 miles of forest burning or recently burned, along the Valdez-Fairbanks trail. Many culverts, bridges, corduroy and telephone poles had been destroyed.

"The actual damage to the Valdez trail itself is as much as it would have cost to have prevented fires."

WOOD PULP IN ARGENTINA

AS THE result of experiments carried out by a Swedish paper expert, it has been ascertained that Argentina produces a tree in abundance which provides excellent raw material, better even in quality than that usually employed in making paper pulp in both Europe and the United States. This tree is the *Araucaria imbricata*, a picture of which may be seen in AMERICAN FORESTRY for August, page 850.

The Principles of Landscape Forestry

The Art of Managing Pleasure Woods, in Which Profit Is of Less Importance Than Sport or Beauty

By Wilhelm Miller

Division of Landscape Extension, Department of Horticulture, University of Illinois.

DURING the eleven years when I frequently visited great estates I had the good fortune to meet many persons who owned exceptionally beautiful woodlands. When my advice was asked about the management of these woods I at first referred the owners to the regular foresters. But soon I began to receive complaints that the professional men could not get the point of view of their clients. One trouble was that the commercial forester wanted to cut down at once all the trees that the owners valued most. When profit is the aim it is quite right to harvest mature trees, but when a man is keeping woods for pleasure he does not like to see all his biggest trees cut down. A man of twenty or thirty may be willing, because he expects to see another generation of trees grow to their full beauty, but a man of fifty or sixty expects to enjoy his woods only ten or fifteen years. Therefore, much has to be planned for that brief period, especially when the next generation may not keep the place. Your Wall Street man is not a sentimentalist in business, but he is a sentimentalist about his country home and he has a peculiar sense of comradeship with mature trees. He recognizes that they have a long record of solid achievement, like his own. He himself would not like to be rudely set aside by the world just when his judgment is best, and he does not like to have his trees swept away just when their beauty is mellowest. The thought of selling such trees for profit is as repulsive to him as betraying one's friends for money. The average captain of finance would rather spend money to prolong their lives. And, under the circumstances, can you blame him?

The great mass of mankind has a similar attitude about street and shade trees, and that is one reason why the tree-mending enthusiasm swept the country a few years ago. As an editor I encouraged that movement, and even now I cannot believe, as some do, that it has done more harm than good. On the contrary, tree surgery has saved thousands of grand, historic trees that otherwise would have perished of neglect. Moreover, it has educated the general public to take better care of trees. The commonest charge made against the tree surgeons is that their prices are too high. Granting that this may be true, and

Photo by A. G. Eldredge.

BEFORE REVEALING A VISTA INSIDE THE WOODS

Across this stream is an uninteresting mess of young trees, mostly of short-lived species, like the soft maple. The removal of three small trees near the center of this photograph will give a fine terminal feature or vista-point.

a serious matter with people of moderate means, it is not an unmixed evil, for the more a person pays to save a tree, the more he is likely to love all trees and to help to save them. Another complaint that commonly reached me was that the tree doctors' system of charging by the

Photo by J. Horace McFarland.

A POOR VIEW OF WOODS FROM OUTSIDE

The ordinary woodlot has a sharp browsing line made by cattle. The commercial forest is still more artificial, especially when composed of a single kind of foreign tree, set in rows and trimmed up. Neither type has charm because one can see straight through the woods and nothing is left to the imagination.

day or hour gives them a selfish interest in making as much work as possible. Consequently, they are said to put a lot of expense into old wrecks that have little beauty or other value. City foresters declare that the average street would be improved by cutting out about half the trees, but a man dislikes sacrificing a tree into which he has put a lot of money. Landscape gardeners assert that they often have trouble about cutting or improving views because of trees that have been much patched by menders. I believe that the tree surgeons can be often employed to advantage in their specialty, but I have yet to meet one who understands the principles of "landscape forestry," as people are now beginning to call the art of managing woodlands for pleasure rather than profit. For the best advice, owners should turn to those landscape gardeners who have special knowledge of this subject.

DRAINAGE OF WET WOODS

One of the first principles in the design of pleasure woods is to make them healthful and comfortable. There are generally swampy spots where mosquitoes breed, and some of these may be the malaria-breeding kind. A good landscape gardener understands enough about engineering to solve such problems, without the needless destruction of beauty which engineers commonly inflict. It is easy to drain woods too thoroughly, so that the water-loving flowers will not thrive. The landscape gardener is always on the watch for a chance to make a water-lily pool by digging out part of a swamp. In such case the mosquito problem is solved by means of goldfish. Another point the engineer is likely to miss is a chance for a bog garden, where the finest hardy orchids, pitcher plants, and fringed gentians can be grown in beautiful sphagnum moss. These bog gardens are not as wet as

Photo by A. G. Eldredge.

A BETTER VIEW OF WOODS FROM THE OUTSIDE

A border of shrubbery makes a piece of woods look deep, rich and mysterious. The fringe at the left is composed mostly of Western crab-apples, *Pyrus loensis*, like the one in bloom at the right.

A VIEW FROM THE INSIDE OF A WOOD TO THE OUTSIDE

The shrubbery border at the edge of a forest should be opened whenever there is a good view of farmhouse, water, hill or other attraction. This is the home of an Illinois farmer, Mr. J. H. Sconce, of Sidell, as seen from the woodlot which he has restored with native shrubs and wild flowers.

the name may suggest, for they have good, dry walks. I have seen some famous examples in England that contained many choice species of lily, primrose, azalea, and rhododendron that bloom only in bog gardens. There is a good American example near Haverford, Pa., on the estate of the late Clement A. Griscom, where the tall, yellow-flowered pitcher plant of the South makes a wonderful impression.

DRIVES

A second principle in landscape forestry is accessibility. The lives of society people are so full that some estate-owners rarely visit their own woods more than once or twice a year—especially if there are no drives. Some ladies cannot walk far, and even the most enthusiastic trampers often feel in the mood for a woodland drive. I believe that Mr. Julius Rosenwald has done well to have his main drive follow the ravine from the entrance to the house, at Ravinia, Ill., for in this way he is sure to see the main woodland beauties of his summer home every day. His case is somewhat exceptional, however, and should not be considered a precedent for violating the sanctity of deep woods by allowing noisy motorists to speed through. It would be a shame to spoil Starved Rock Park, for instance, in this way. Architects are apt to extend one of the axes of the house far out into the landscape, and their straight drives through woods are often painfully artificial, to say nothing of missing some of the finest natural features. Some of the famous lanes made by Mr. Paul Cravath and others near the country club at Glen Cove, N. Y., come under the head of landscape forestry and have caused a revival of riding under delightful conditions. Some sort of wood road is nearly always necessary for practical purposes, such as the removal of dead trees and other inflammable material. Mr. Bayard Thayer, of Lancaster, Mass., prepared for the coming of the gypsy moth by making a road system so elaborate that every tree can be reached by spraying.

TRAILS

The making of trails seems to appeal to all classes, rich and poor, old and young—probably because it awakens the spirit of discovery. I have known very wealthy men who never cared to do any gardening with

AN OUTLOOK THAT HAS BEEN MAINTAINED FOR A QUARTER OF A CENTURY

This cutting was made by W. C. Egan, of Highland Park, Ill., to give a glimpse of Lake Michigan. The passing boat is more apparent to the eye than to the camera and is more picturesque when framed by foliage than when seen in the open.

their own hands to don khaki and pick up the hatchet with the greatest enthusiasm when they once got the idea of blazing trails. A man who has created an immense new business may be afraid to lay out a system of trails in his own woods, without expert advice, until he understands how the finest vistas are quickly created by intelligent use of the axe, rather than by the slow and pottering work of raising flowers from seeds. We can grasp the main features of the great art of vista-making by briefly considering, first the general appearance of the woods in the landscape, second the views from the interior to the outside world, and third the vistas that are wholly inside the woods.

Photo by Mrs. Lew Wallace, Gale Farm, Galesburg, Ill.

A NATURAL GLADE IN TYPICAL MIDDLE WESTERN WOODLAND

Just the place for a campfire, players' green, or wild garden. Like a sentinel, at this natural gateway, stands a hawthorn, with horizontal branches that connect this type of woodland with the great prairie outside.

VIEWS OF WOODS FROM OUTSIDE

Seen from house or grounds, the average farm woodlot is a singularly unromantic proposition compared with wild forest. This is chiefly due to the browsing line made by cattle, since they eat the foliage as high as they can reach. I am not denying that the familiar deer parks of England look very good to the unaccustomed eyes of an American, for this type of beauty has been ripening for a century or more, and the wide-spaced trees are all handsome specimens. But the ordinary American woodlot is crowded with undeveloped trees, and, worst of all, one can see right through them at a glance. There is nothing left to the imagination except, perhaps, the amount of money the farmer got for the hogs that have destroyed every growing thing beneath the trees.

The most beautiful woodlands in the world, according to many experts, are those which have the very real quality commonly known by such impractical-sounding names as seclusion, mystery, or charm. This effect can generally be secured simply by restoring to the woodland its natural fringe of shrubs and small trees, such as hawthorns, dogwoods, and viburnums. I once took a photographer from New York to Massachusetts to picture the superb edging of Mr. Thayer's woods. Under Prof. Sargent's direction Mr. Thayer had cut heavily into his forest so as to bring his most valuable trees into view from the house. These are white pines, which were formerly lost in the woods, but now have developed splendidly on the side exposed to the sun. These stately evergreens are now connected with the meadow by a self-grown border of hawthorns and other shrubs which are attractive the year round, while in the spring they make a show of blossom such as the ordinary cow-spoiled woodlot never gives.

Such a shrubbery border should not be a complete circle, for the woods look much more inviting when one can see a driveway entering them, and it is often best to cut deep enough into the woods to make at least one fine view from the living room. Mr. Thayer has cut many acres of big trees in order to get a series of fine woodland views from his terrace. One cut goes clear through the main forest in order to show a lake. Another goes into the wood far enough to reveal a magnificent mass of mountain laurel. Country clubs are now

Photo by Fuermann.

A GLADE CARVED OUT OF A MIDDLE WESTERN WOOD BY A LANDSCAPE GARDENER

This is one of a series of outdoor living rooms in the woods, each of which is entered through a pair of stratified hawthorns like the one in the picture on page 972. Designed for Mr. Hibberd, of Winnetka, Ill., by O. C. Simonds. This glade is bordered with native phlox and madonna lilies. Col. F. O. Lowden has one bordered with wild flowers. A wilder and more permanent effect can be had with native shrubs.

beginning to do things like these, as the old straight gashes commonly made on links cannot long please the cultured members of society.

VIEWS FROM INSIDE OF WOODS TO THE OUTSIDE

Owners of pleasure woods generally wish a drive or walk around their forests near the edge. This instinct is justified, for most people tire of any one type of scenery unless they are refreshed by occasional glimpses of a different sort of beauty. Therefore, the owner and his advisor should go clear around the woods, keeping near the margin, to locate the best and worst outlooks. Often it is necessary to screen some unsightly object, for it is unpleasant when roaming the woods to come suddenly upon the village dump, a neighbor's barnyard, the shacks of laborers, or a line of poles and wires. It is very pleasant, however, after having no glimpse of the outside world for a quarter of an hour to come unexpectedly upon a masterful cutting that reveals a beautiful house in the distance, especially if it is your own home. Mr. Harvey J. Sconce, of Sidell, Ill., who is one of America's genuine country gentlemen, has a good view of his house from his woodlot. I shall never forget the thrill with which I first glimpsed the dome of our National Capitol down a man-made vista through the woods. There must be hundreds of people around Washington who might make a dramatic framework for this great architectural picture. One of the earliest vistas in the Middle West was cut through woods at Gambier, Ohio, to show a church spire, while another looks down to a small river. Sometimes a broad slash is necessary for a mountain view, like the best outlook to the Orange Mountains from the Essex County park system in New Jersey. Most people, however, having no chance for a view of noble buildings or some great natural spectacle, are apt to overlook the little vistas. The landscape forester can often discover many of these fine bits by the very simple expedient of bending the knees up and down. One is able to see farther through rather dense woods from such a position than when standing upright. It is not always necessary to own costly ocean or lake frontage in order to get such glimpses. For example, Col. H. L. Higginson, at South Manchester, Mass., has a fine view of the sea through woods, and Mr. W. C. Egan,

whose three-acre place at Highland Park, Ill., has been an inspiration to many thousands of home-builders, has maintained for twenty-five years a cutting through his woods which affords the tiny picture of Lake Michigan shown on page 971.

A dozen little vistas through woods to such simple features as meadow, rocks, tree, brook, or waterfall will lift a commonplace woodlot into the class of art works.

VISTAS INSIDE THE WOODS

I sympathize with those people who like absolute wildness and heartily believe in leaving a portion of the woods entirely alone, if such a thing is possible. Ordinarly, however, when woods are simply neglected, insects and diseases kill or disfigure most of the trees, while the survivors grow too high for their leaves, flowers, and fruits to be seen with ease. Moreover, one can hardly see even the trunks of the biggest trees because the little ones are in the way. To enjoy a century-old oak one must be able to see it far off enough to get an idea of its height, spread, and character.

Consequently, it is generally wise to cut vistas to the largest trees and to make these vistas parts of the system of drives and trails. Any beginner can understand this principle, but if he cuts at one operation all the small trees surrounding a big one, he is likely to kill the best tree by too much sunlight. It is often prudent to thin about one-fourth of the surrounding trees. By this method the central tree becomes gradually accustomed to enduring more light. Anyone who thus pays honor to a favorite tree, as suggested in this article, is not likely to go back to the old sentimentalism which forbids all use of the axe. On the contrary, he is likely to become ardently enthusiastic about landscape forestry. He tramps the woods to discover the largest rocks, and those of the strongest stratification, finest color, richest moss, or rocks with trees growing through them. He seizes upon every glade as a chance for a campfire, players' green, or wild garden. And he tries to bring all the best features into a system of trails, Some prefer to carry a can of red paint, instead of a hatchet, and give a dab with the brush to every tree that is to feel the axe during the winter or whenever convenient.

WILD FLOWERS

One of the main objects of landscape forestry is the production of great masses of wild flowers that will multiply without care and betray no work of man. It is pleasant to see thousands of hepaticas, blue, white, and pink, or of bloodroot flowers glancing in the April sunlight, wild blue phlox by the acre, and American bluebells carpeting the forest floor so thickly that one cannot step off the trail without crushing the flowers. (See page 975). The woods were once as floriferous as the picture below and the modern watchword is restoration. A landscape gardener of Chicago has sent me an itemized list of $6,000,000 worth of work that he has done since

Photo by Jens Jensen, Landscape Architect.

RESTORATION OF THE WILD FLOWERS IS ONE AIM OF LANDSCAPE FORESTRY

This natural "sun-opening" in a Wisconsin forest is full of the large blue flag *Iris versicolor*, suggesting the abundance of wild flowers before man's interference. Mr. and Mrs. C. L. Hutchinson have an iris glade in their woods at Lake Geneva, Wis.

Photo by G. A. Eldredge.

A FAVORITE THEME OF RESTORERS—AMERICAN BLUEBELLS

Perhaps the finest blue flower of the woods in spring is *Mertensia pulmonarioides* (*M. Virginica*). The sky-blue trumpets have a perfect foil in the pink buds. Large colonies have been restored by Mr. and Mrs. Cyrus H. McCormick, at Lake Forest, Ill.

1901, in which restoration is the leading idea, and much of this has been done in woodland. One of the finest restorations I have seen is at the summer home of Julius Rosenwald, Ravinia, Ill. Here, water has been supplied to a typical ravine of the Lake Forest region, and canoeing is now enjoyed for a distance of 1,000 feet on a winding stream whose wooded banks are brilliant with wild flowers in such profusion as one never sees in woods that are open to the public.

METHODS OF WILD GARDENING

A masterfully simple method of producing great colonies of wild flowers is to thin out the trees enough to encourage wild flowers but not enough to encourage grass. You remove most of the crooked, diseased and spindling trees and sacrifice many perfect saplings of the short-lived species in favor of the long-lived kinds. Such work should generally be distributed over four years. It makes a marked improvement in general appearance at once.

This method can be supplemented by broadcasting seeds of desirable species that can be cheaply collected in the neighborhood. Occasionally one finds great quantities of berries, such as wild grapes, viburnums, dogwood, shadbush, bittersweet, and partridgeberry. Sometimes it pays to buy seed in bulk from seedmen. I have never seen any large results from haphazard sowings; it is better to keep good records of the kind and quantity sowed, the location, date, and circumstances. There is a good deal of waste in this method and it is not the quickest way, for perennials rarely bloom the first year from seed. Hawthorns and the like do not germinate until the second year and are slow-growing.

For immediate effect it is necessary to use plants rather than seeds. Since these cost more, they are set only at the points of greatest interest. For example, vines and shrubs are planted at the entrance to the woods, and perennials are put beside the trails, from which they will gradually spread to the heart of the wood. Beside the spring or brook one plants forget-me-not, marsh marigold, sweet pepper bush, winterberry, or hobble bush. Where winter color is wanted, bittersweet, Washington and cockspur thorn, mountain ash, partridgeberry and wintergreen are often suitable.

Those who wish to carry the subject of landscape forestry further will enjoy collecting a small library of inspiring and helpful books. "The Wild Garden," by William Robinson, is a classical work which every country gentleman should possess. A delightful way to learn the wild flowers, etc., is to have some of the popular, illustrated books like Dane's "How to Know the Wild Flowers," a similar work of pocket size by F. Schuyler Mathews, Keeler's book on shrubs, and "The Tree Book," by Julia E. Rogers. In propagating plants of all kinds Bailey's "Nursery Book" is valuable. There are many dealers who sell bird houses and other apparatus for attracting the birds. Write to the United States Department of Agriculture for McAtee's "Plants That Attract Birds" and ask the National Association of Audubon Societies, 1974 Broadway, New York, for its literature, especially about Baron von Berlepsch's methods of attracting woodpeckers, since these are the greatest destroyers of insects that harm forest trees. Bailey's Standard Cyclopedia of Horticulture describes every species of tree, shrub, vine, and wild flower that is offered for sale in America, and practically everything worth having can be had from nurserymen or collectors. As it is not customary to print the names of tradesmen in articles, I have deposited with the editor of AMERICAN FORESTRY the names and addresses of four or five nurserymen and collectors who advertise every wild plant that the average person can think of and many more. Some of these catalogues are attractively illustrated and anyone who owns a bit of woods should send for all of them.

Photo by A. G. Eldredge.

AFTER REVEALING A VISTA INSIDE THE WOODS

This magnificent specimen of the burr or mossy-cup *Quercus macrocarpa* will be brought into the lives of the children in the excellent kindergarten at Brookfield, Ill., if three small trees are sacrificed. The oak is about three feet in diameter and more than a hundred years old.

THE LARGEST TREES

THE American Genetic Association of Washington, D. C., has announced the award of two prizes of $100 each for the location of the largest nut bearing and non-nut-bearing trees in the country.

The largest nut-bearing tree is a valley oak on the ranch of B. F. Gruver, San Benito County, Cal., in the foothills of the Sierra Nevada Mountains. This lordly tree measures 37 feet 6 inches in circumference. It is near the city of Stockton, and the natives, who declare that it produces a ton of acorns every year, take pride in it.

It is expected that the "discovery" of this tree will be at once a surprise and a disappointment to the friends of the famous Hooker oak of Chico, Cal., named for the English botanist, Sir Joseph Hooker, who, in 1872, declared that, so far as encyclopaedic knowledge went, it was the largest oak in the world. Several persons sent in photographs of the Hooker oak, which, however is only 21 feet 8 inches in circumference, although it rises to a height of 105 feet.

The largest tree in the non-nut-bearing class of hardwoods disclosed by the contest is a sycamore near Worthington, Ind. This tree is 150 feet high, after having had its height considerably reduced by lightning and wind. It has a spread of 100 feet and its trunk 1 foot above ground is 45 feet 3 inches in circumference, while its east branch measures 27 feet 8 inches around and its west branch 23 feet 2 inches.

The second largest nut-bearing tree disclosed by the contest is a chestnut 3 miles from Cresmont, N. C., on the main range of the Big Smoky Mountains which divide North Carolina and Tennessee. This tree is 75 feet high and has a circumference of 33 feet 4 inches.

It is announced that the contest confirms the fact that the sycamore is the largest hardwood tree in North America. Yellow poplar ranks next to sycamore in point of size among the non-nut-bearing hardwoods. One of the photographs submitted in the contest was of a yellow poplar near Reems Creek, N. C., which is estimated to be 198 feet in height and 34 feet 6 inches in circumference.

TO A MOUNTAIN ABOUT TO BE LUMBERED

By PAULINA BRANDRETH

A monument of ageless time
Snow-piled against the evening skies,
Thy slopes in timbered splendor rise,
Each tree encased with frosted rime.

And lo! upon thy glistening crown
Benign, the rising moon looks down.
O mountain, could thy forests be
Left to the moon's sweet charity!

The Bird Department

By A. A. Allen, Ph.D.
Assistant Professor of Ornithology, Cornell University

The Departure of the Birds

EVER since the last of July the birds have been leaving, but the dimunition in their numbers has been so gradual and the entrance of others from the north has been so inconspicuous that probably few people have realized that a migration has been in progress. It is not until October that most of us recognize that the birds are departing. For the fall migration is very different from that of the spring.

In the spring the coming of the birds is so conspicuous a part of the change from winter to summer that it has been heralded since biblical times and even earlier. But in the fall there are no bright colors, no joyous songs to announce the passing. In silence the birds slip past us and few are the chronicles that record the travels of the modestly attired wayfarers which, after the nestling season, begin the long flight to the south, some of them travel over 8,000 miles from Alaska to Patagonia, many of them but a few weeks out of the nest and making the journey for the first time, and all with no compass to guide them.

THE DEPARTURE OF THE BIRDS

It is not surprising that birds in migration have fascinated mankind, not surprising that governments employ scientists to study and investigate them and little wonder that thousands of people, scientists and laymen, spend much time following the birds in an effort to learn their secret. The facts which have been discovered have relieved us of much of our ignorance but the great mystery of how migration originated still remains and we can, at best, offer but theories to account for it.

Let us first consider some of the more interesting phases of migration that modern investigation has thrown light upon. It is now a matter of common knowledge that all birds do not migrate. Many species in the north are able to accommodate themselves to the rigors of winter and never pass out of the neighborhood in which they are raised. The chickadees, nuthatches and woodpeckers that come to one's feeding station in winter, in northern United States, remain in the spring to nest in the vicinity, while in the south, the familiar mockingbirds and cardinals are ever present. The farther south one goes, the larger is the percentage of non-migrant birds until one reaches the tropics where no real migration occurs. Even here, however, the coming and going of our northern species are conspicuous features of the bird life, and there is probably no place in the world where migrating birds are never seen. In places of the same latitude, however, migration is more pronounced in some than in others, reaching its maximum in eastern United States and western Europe, and being much less pronounced in the southern than in the northern hemisphere.

Between the birds that do not migrate at all and the Arctic tern which migrates 10,000 miles twice a year between its Antarctic wintering ground and the Arctic shores where it nests, there are all gradations of migrants.

A PAIR OF BOBOLINKS

These birds nest in the northern part of the United States and winter in Brazil. Each year after traveling ten thousand miles they return to the same meadow.

Some birds like the meadow lark, robin, bluebird and chipping sparrow which nest throughout most of United States and Canada, merely withdraw into the southern part of their breeding range during the winter while their places are taken by such birds as the tree sparrow, snow bunting, pine grosbeak and siskin that nest in northern Canada and migrate in winter as far south as northern United States. Other species that nest in northern United States and Canada, such as most of the flycatchers, warblers and vireos, pass out of the United States

entirely and spend the winter in Central America or northern South America. A few species like the bobolink, night hawk and golden plover, pass over the mountains of northern South America to winter on the pampas of Brazil and Argentine, while a few others amongst the shore birds, the knot and yellowlegs, for example, wander to southern Patagonia.

One of the strangest features of the migrations of some of these birds that winter in South America is

THE CHICKADEE

One of the birds that does not migrate and which is enabled to accommodate itself to the rigors of the northern winter. The nuthatches and woodpeckers also share the northern winter with it.

that they pursue different routes in the spring from those in the fall. The golden plover, for example, which nests along the Arctic coasts of North America in the fall, fly southeast to Labrador and thence due south to South America, a few stopping along the Atlantic coast. But the majority fly directly over the sea, a distance of about 2,400 miles, to the north coast of South America and thence to Argentine. At this time of the year they are never seen in the Mississippi valley. In the spring, however, they strike United States along the Gulf coast, and all migrate up the Mississippi valley, at this season never being seen along the Atlantic coast.

But this double route is the exception. The vast majority of birds just move southward after the breeding season, following the routes where food is most abundant, shunning areas where food is scarce, until they finally reach their winter quarters. In the spring they move northward along the same highway.

The fall migration is marked by much more dallying than the spring and by much more wandering, some birds delaying their actual migration by trips to the north, east or west. There is no hurry so long as food is abundant, and some birds like the snipe, woodcock and many species of ducks remain until pressed for food by the killing frosts or the formation of ice over their feeding pools. Most species, however, start southward while food is still abundant.

The fact that so many species leave long before food becomes scarce makes the reason for their going the more strange and brings us to the question of why they migrate and how they know when it is time. The regularity with which birds arrive in the spring has been observed since ancient times, but it has not been until the modern investigations that we have understood the delicate physiological adjustment which records time for the bird almost as accurately as a timepiece. The physiological cycle is as precise in a healthy bird as is the revolution of the wheel of an engine. The bird's year begins with the slightest increase in the size of the reproductive organs, for they are not, as in some of the higher ani-

THE MEADOW LARK

These birds, which nest throughout most of the United States and Canada, merely withdraw into the southern part of their breeding range during the winter while their places are taken by such birds as the tree sparrow, snow bunting, pine grosbeak and siskin that nest in northern Canada and migrate in winter as far south as northern United States.

mals, of constant size throughout the year. The increase is a sign that the breeding season is approaching and with migrating species there comes the concomitant instinct to migrate and the bird begins its journey to the breeding ground. If there were no such thing as weather, if food were always equally abundant, the bird would arrive at its nesting ground on exactly the same day each year. Indeed, this is said to be the case with some of the sea birds, notably the puffins, which are little affected by the weather. They spend the greater part of the year

at sea, but each year on exactly the same day they appear on their breeding islands.

The first birds to migrate, like the robins and blackbirds, are the least punctual because in the early spring the weather is least settled. The later migrants become more and more punctual as the weather becomes more uniform until with those birds coming after the first of May we can prophesy the day of their arrival at any place with considerable accuracy.

Now if birds had no enemies and always hatched their first eggs successfully, it is probable that the fall migration would be equally regular, because after the breeding season the reproductive organs begin to decrease in size just as they grew in the spring. But many birds have to make several attempts before they raise a brood successfully, and while they are still feeding their young in the nest, others of their species are ready to leave. Some species, however, wait for a second or even a third brood, but the majority are ready after the first brood to enter once more upon a care-free existence. Some species, like the swallows and blackbirds, assemble in large, conspicuous flocks before migrating, but others just slip away unnoticed, usually the old birds first, followed later by young of the year. It is the periodic changes in the reproductive organs, then, that tells birds when to migrate and the concomitant instinct impels them to go.

But this does not explain how and why birds came to migrate in the first place. It may explain how the instinct is maintained, but not how it has been developed. For this, of course, we have to resort to hypotheses. Without going into detail, it may be interesting to review the one which receives greatest credence today. It is founded upon two beliefs which we now look upon almost as facts: first, the origin of bird life upon this continent, and secondly, the coming of a glacial period or ice age when most of the birds were again driven out.

In North America, it is undoubtedly true, that we have received our birds from two sources: from South America and from Asia by way of Alaska. We know this because some of our species are almost identical with those of Europe and Asia, while others are very similar to South American forms found nowhere else in the world. If we can imagine the South American birds, in ages past, gradually spreading northward because of an overcrowded condition or because of the natural instinct, inherent in most organisms, to cover as much territory as possible, we would find them eventually coming into a land which, while similar to that of their progenitors during a part of the year, was entirely different during winter and unsuited to their needs. They were, therefore, able to occupy it only during the summer months and each winter had to retire southward. This would have been sufficient to eventually form a migrating instinct of considerable power and regularity, but it does not explain all the variations in route and distance travelled which we see today.

During the numerous geological ages that have ensued since birds first came into North America, the continent and the climate have seen great changes. North America has changed from a mild, semi-tropical land to one covered with snow and ice and back again to a land of decided seasons. If we think of birds as having become established during the semi-tropical times, even without any decided migrations, we can still think of them developing this instinct to migrate under the stress of the slowly approaching ice age, the birds being driven southward to seek quarters in an already overcrowded tropics, and striving northward with each returning spring and recession of the glaciers only to be forced back again the following winter.

THE TREE SPARROW

This bird nests in northern Canada and in winter migrates to the northern part of the United States. Just what the sense is which directs migratory birds to return to the same place year after year the scientists do not know.

One might follow this thought into great detail and show how the various routes followed by birds between North and South America may have been evolved, but we cannot take space for it here. There remains one other problem which seems even more mysterious than the origin of migration, and that is how birds find their way.

Each year the bobolink after traveling 10,000 miles comes back to the same meadow, and the oriole comes back to the same tree. The robin and the phoebe come back to the former nests and construct others close by or even on top of the old structures. What is it that guides them on their long journey and brings them back so precisely? It is instinct, we now say, a sense which,

not having ourselves, we are unable to understand. That sense which directs the carrier pigeon back to the home loft, five days' journey distant, is probably the same that guides all birds on their migrations, and we call it a sense of direction. There have been numerous observations to support this theory and some modern experiments upon terns carried in the hold of a ship 1,000 miles out of the range of the species, which, when released, flew back directly to their nests, have conclusively shown that birds do have this sense. But just what the sense is and what controls it we have yet to learn.

BIRD LIFE IN OCTOBER

October is a month of changes. The killing frosts have nipped the leaves and every gust of wind sends fluttering showers to the ground. The gray skies, the purple hills and the golden trees are preparing us for winter. Bird life, too, is changing. Although some of our summer birds, even among the warblers and flycatchers, still cling to their posts, before the month has run its course all but a few of the hardy seed-eating sparrows and blackbirds will be gone. The last of the transient visitors that nest in northern Canada and winter in Central or South America will pass through and the hardy winter residents will arrive. The waterfowl which have been straggling along since the middle of August or September are now receiving added impetus from the northern forests, and toward the last of the month great flocks will fill the air and cover favored ponds.

Thickets and the borders of woodlands now teem with various species of sparrows, and overgrown fields, where they are busy consuming great quantities of weed seed, resound with their calls. A few vigorous individuals among the song sparrows and white-throats have more than regained the vitality lost through the moulting season and now sing with almost spring-time fervor. The majority, however, if they sing at all, do so in subdued tones that are difficult to recognize.

Certain shrubs and vines now bear fruit that attracts many birds. The wild grape and the Virginia creeper are thronging with late thrushes and the bayberry draws flocks of myrtle warblers. If one has been feeding the winter birds in previous years, they will now begin to come back to the feeding station in search of the food which they grew accustomed to find.

October also begins the real hunting season when the sportsman dons his khakis and tramps the woods for grouse and woodcock or wades the marshes for ducks and snipe. It is legitimate sport and these are birds preeminent as game birds that serve man best in this capacity.

Forestry at the Exposition

AMERICAN FORESTRY ASSOCIATION DAY at the Panama-Pacific Exposition is Wednesday, October 20. The meeting will be held in the Lumbermen's Building on the Exposition grounds, the president, Dr. Henry S. Drinker, president of Lehigh University, presiding. Foresters from all over the United States, Pacific Coast members of the Association and others who are attending the Exposition at the time will be present, and with them will be numbers of the leading lumbermen and loggers of the West.

President Drinker will speak on the forestry situation in the United States and F. C. Knapp, vice-president of the Western Forestry and Conservation Congress, will talk on the relation of the western foresters with those of the east. P. S. Ridsdale, editor of AMERICAN FORESTRY, will tell what the magazine is doing in furthering forestry throughout the entire country and Director E. A. Sterling will read a paper on the work of forest protective associations in the East, prepared by W. R. Brown, president of the New Hampshire Timberland Owners' Association. Chief Forester Henry S. Graves, will speak about the Government and the lumber industry. H. D. Langille, of Portland, Ore., will discuss the relations of timber owners and fire protective organizations; E. A. Selfridge, Jr., president of the California Protective Association, will talk about taxation and forestry and there will be other discussions and addresses on subjects related to forestry.

The first day of the week, the eighteenth, will be devoted to a meeting of the Society of American Foresters, also at the Lumbermen's Building. There will be addresses by Chief Forester Graves on the forester's ideals; by Coert DuBois on the forester's opportunities; by D. T. Mason on what the Society has done and is doing for foresters; by Dr. B. E. Fernow on the forester's professional ethics; by G. M. Cornwall on the forester's duties toward lumbering; by F. E. Olmstead on the lumbermen's duties toward forestry; by Judson F. Clark on the place of logging engineering in forestry; by A. F. Fischer on the forests of the Philippines and by H. M. Curran on the forests of the Argentine Republic.

Tuesday, the nineteenth, will be devoted to meetings of the Western Forestry and Conservation Association to be taken up largely by addresses and discussions on the various problems of forest fire protective work, and on Thursday, the twenty-first, the Pacific Logging Congress will meet in annual session. The remaining two days of the week will be spent by those who wish to go on an excusion to the redwood logging camps of the Pacific Lumber Company and the Hammond Lumber Company at Scotia, Eureka and Samoa in northern California.

National Conservation and Water Powers

By Herman H. Chapman

Professor of Forestry at Yale University. Chairman of Committee on Policy and Legislation, American Forestry Association.

In the July number of American Forestry (page 818) appeared a review of a recent publication on the Conservation of Water by Storage. In this review emphasis is placed upon the question of national regulation of water powers in such a way that a casual reader might conclude that the entire theory of government retention of ownership of national resources is wrong, and results in waste rather than in promoting conservation. The quotation, among others, which is of greatest significance reads:

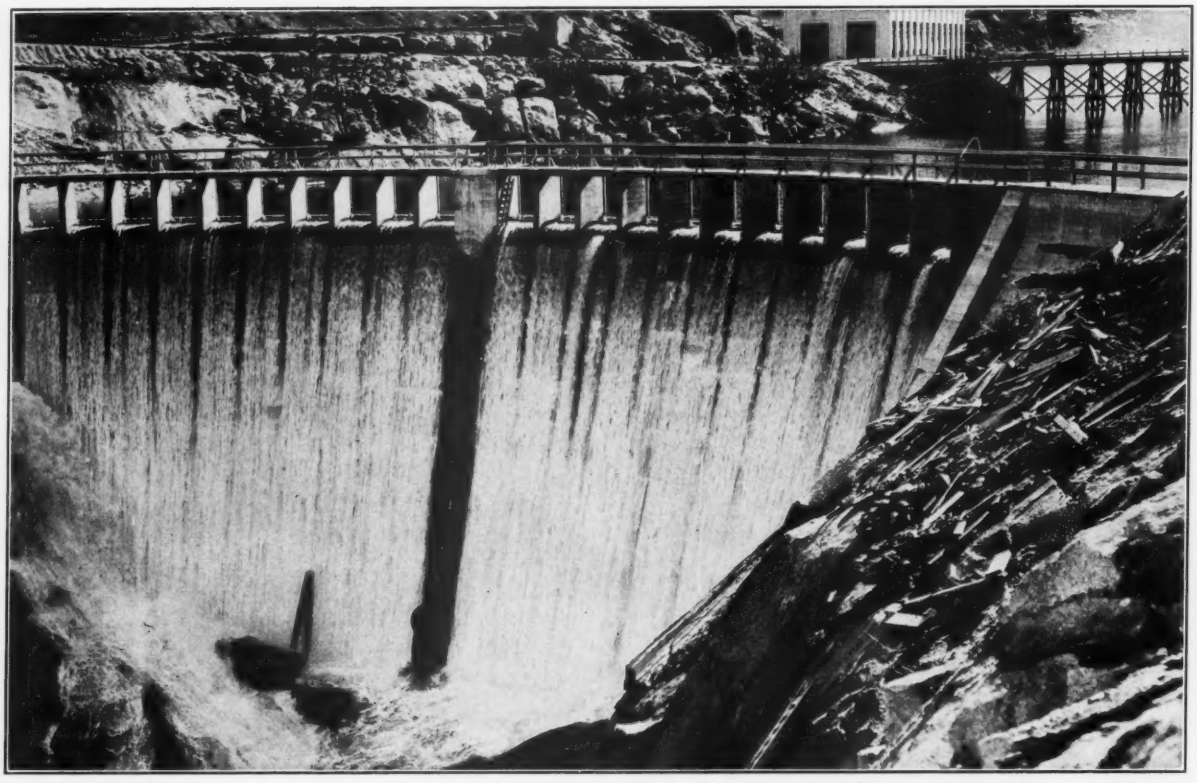
"The Conservation movement, originating in a wise demand for the economical use of our natural (*not national*) resources, has too much *deteriorated* into a demand that those resources be *retained by the National Government* and not permitted to be developed by private capital except under restrictive burdens."

The average American of the old school has been brought up to believe, first, that public lands and their resources exist solely for the purpose of acquisition by private parties for their personal benefit; second, that public jobs are sinecures to be striven for and obtained by those who have sufficient political influence to secure them. Opposed to this doctrine of *laissez faire* is the theory that the nation should retain and manage the remnant of its once enormous timber resources together with publicly owned grazing lands and water powers, and that the trained civil service employes of the government are capable of administering these resources to the mutual benefit of the public and of the capitalists who develop them.

There is no question of the sincerity of those who champion the doctrine of private acquisition and uncontrolled exploitation of public resources in the interests of prosperity and progress. The writer at one time believed that he had as much right to a timber claim in northern Minnesota as anyone else, although the only possible use to which he could have put it was to have sold it to some lumber company.

INTAKE RESERVOIR FOR PLANT NO. 2, NEVADA-CALIFORNIA POWER COMPANY

This plant, on Bishop Creek, Inyo National Forest, California, is one of a series of five developments on Bishop Creek, four of which are under Forest Service permits. The power is employed in mining, irrigation pumping, and general use in southern California. A permit for the construction of an additional plant has been applied for. The present aggregate installed capacity is 30,000 horsepower.



DIVERSION DAM FOR PLANT NO. 2 OF THE PACIFIC LIGHT AND POWER CORPORATION

This is on Big Creek, Sierra National Forest, California. Practically all the land used by this company is within the Sierra National Forest. Further developments contemplated by this company on the same forest will utilize power sites both on Big Creek and on the San Joaquin River.

Let us admit the force of these arguments. Business must be profitable to exist, and the welfare of many regions depends largely on the prosperity of certain large enterprises.

But, is it impossible to do business with Uncle Sam, and cannot the general welfare be better protected in this way? Water power representatives answer emphatically No! Regulations are burdensome; they reduce profits; and uncertainty of tenure through revocable leases, makes it impossible to secure capital for such investments except at greatly increased rates. It is asserted that those who insist that the nation should retain its property in waterpowers do not grasp the intricate financial and engineering problems involved in waterpower development, and are enemies of true conservation, for while they hamper and prevent capital from developing these powers, millions of horsepower are running to waste, never to be recovered or used!

The specific claim made by opponents of national ownership is, that the retention of public lands controlling waterpower and the system of leasing under permit has retarded and hampered the development and conservation of these western waterpowers. To prove this, statistics can be cited to show that the ratio of developed to total available power in western states is very low when compared to states east of the Mississippi. This is true, but does it prove the point? *Water power is a commodity, which must be marketed and used.* To utilize power we must have factories, lighting systems, large towns, a reasonably dense population, and many natural resources to use as raw materials in manufacturing. Profits depend, first upon the market for power, second upon the cost of installation and service, third, upon the price of power. National ownership exerts no influence upon demand for power, and its effect upon costs is confined to a small, almost insignificant charge based on the amount of power developed, and to the "intimidating" effect on borrowed capital or bonds, which might increase the rate of interest or prevent the financing of the enterprise. It is self-evident that investors would prefer to own these powers outright, and that insistence on the principle of leasing has probably caused delay and dissatisfaction in many instances. In spite of this, the *waterpower industry in many portions of the west is at present overdeveloped.* In California alone, for the year 1914, the maximum demand for power was less than 60 per cent of the installation. (Hearings before Committee on Public Lands, U. S. Senate, 63rd Congress, 2nd Session. Page 556.) The power development under lease on national forests is increasing, at present, relatively much faster than elsewhere. During 1914 there was an increase of 36 per cent in the total capacity of all prospects for which permits had been granted, and the actual output of electric energy increased in this one year 150 per cent, or from 111,000 to 266,000 horsepower. If, as indicated, there is a surplus of waterpower in excess of market requirements, in the west, lamentations at the waste of unused powers seem strangely out of place and

create a false impression. Waterpowers cannot be used under any conditions until they are needed. There is at present, on national forests, a total of 1,067,621 horsepower for which permits are outstanding, and the waterpowers already in operation produce 266,797 horsepower.

Instead of immediately increasing the amount of power development, there is reason to believe that the effect of private ownership might be just the reverse, and that a powerful motive for desiring absolute ownership is the opportunity which it insures of holding possession of valuable powers, and keeping off competitors, until the time comes when it will be profitable to use these powers.

CAZADERO PLANT OF PORTLAND RAILWAY LIGHT AND POWER CO., CLACKAMAS RIVER, OREGON.

This public-service corporation is planning to develop additional power through new construction under a Forest Service permit, on the Oregon National Forest. The plant here shown is not under permit, since it does not involve use of National Forest land.

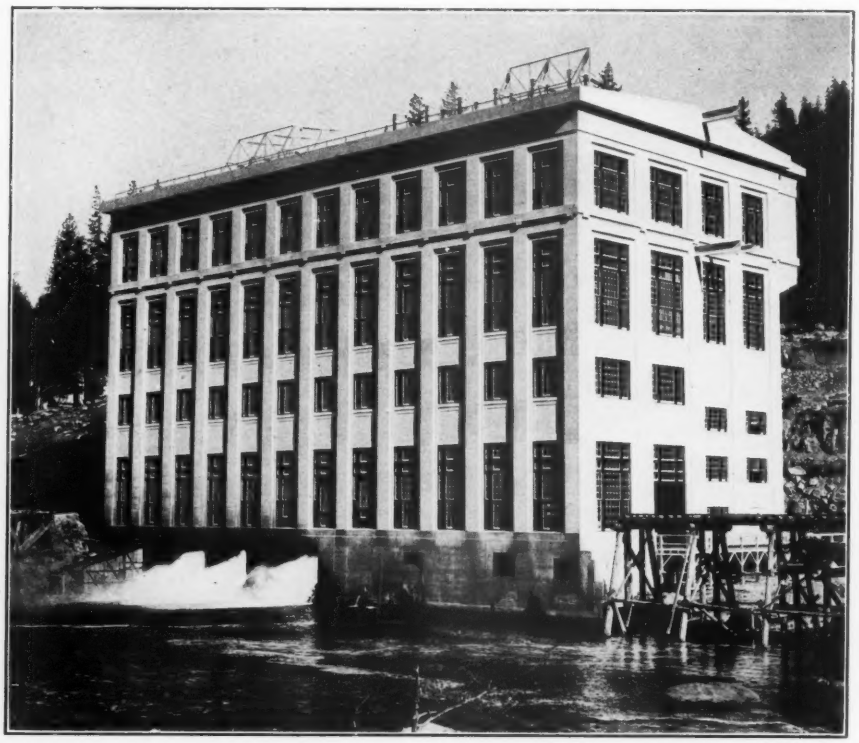
The principle naturally striven for, that of a reasonable profit, urges consolidation of power interests and elimination of competition as a means of assuring this profit.

The present system of leasing effectually prevents artificial restriction of power development. A government permit is granted only on condition that construction work be begun within a specified time. The applicant secures a priority right, and is then given time to prepare surveys and specifications, and to further investigate markets and cost of installation. If he decides that the venture will prove profitable, the lease is granted and actual development work must begin. If not, the permit is cancelled, and another applicant is given opportunity to consider the prospect. The inevitable effect of such a system, provided the terms are equitable, is to secure development at the earliest moment when economic conditions appear to justify the venture, and to absolutely prevent the holding of power in an undeveloped condition as a means of influencing the power market. Meanwhile, *unprofitable waterpowers remain the property of the nation until such time as they are needed.* It is so obvious that the leasing system instead of preventing, *tends to secure the maximum development,* that it would have been well for the champions of private ownership had they made overdevelopment the basis of their objections rather than retardation, and it is notable that much of the opposition to the passage of improved and amended legislation so long sought by conservationists, is based on this feature of insistence on development as a condition of holding leases.

It is not claimed that the present system is perfect. Leases revocable at the option of the Secretary should be made irrevocable (but subject to cancellation on failure to observe the terms thereof) and renewable previous to the expiration of the period of 50 years for which they run. Other modifications are possible without sacrificing the principle of national ownership. The Ferris bill (H. R. 16673, 63rd Congress 3rd session), embodies the principles for which the advocates of *national conservation* contend, and to which those who are not opposed on principle to all government control are substantially agreed. But of late there has been a growing movement to repudiate this bill, and it is the probable intention of waterpower interests to attempt to secure from this coming Congress a radically different measure, which will give them absolute control of national waterpowers, free from all interference. The proceedings of the waterpower convention called in Oregon for September should throw some light on this subject. Efforts may be made to confuse the issue of national

retention of publicly owned power sites with that of national interference in the regulation of private waterpowers,—the purpose being to arouse indignation against unjust and tyrannical interference with state and private rights, under cover of which Congress shall be persuaded to part with what the nation now and always has owned, and has the right to hold.

But the danger of the attack on the conservation of publicly owned waterpowers lies in the effort to drag down in a common ruin the tremendous achievements in other lines of *national* conservation secured in the last quarter century. On what authority is the statement made that the conservation movement originated "in a wise demand for the economic use of natural (but) *not national* resources," and that the demand that these natural resources be *retained by the national government* constitutes a *deterioration* of the conservation movement. Once and for all, let it be understood that the conservation movement in this country began with and still centers on the struggle for retention of national ownership of public lands and resources.



PLANT NO. 1 OF THE PACIFIC LIGHT AND POWER CORPORATION

This plant, on Big Creek, Sierra National Forest, California, is one of two power houses constructed by this company on Big Creek, with an aggregate installed capacity of 94,000 horsepower. The power developed is used in the operation of electric railways in and about Los Angeles. This company's permit covers an ultimate development of 250,000 horsepower on the Sierra National Forest.

Conservation as a public issue originated about 35 years ago, when the founders of the American Forestry Association declared their intention of securing congressional action authorizing the permanent retention by the national government of the title to forested non-agricultural lands. This idea finally found expression in the law of 1891, under which successive presidents have by proclamation created the National Forests totalling 160,000,000 acres in the United States, exclusive of Alaska.

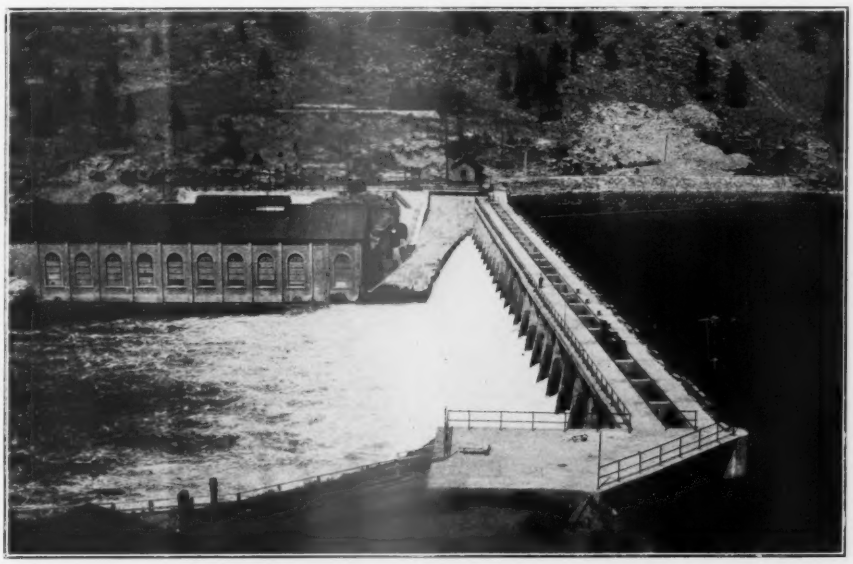
Were the pioneers of this movement, Dr. B. E. Fernow, F. H. Newell, Edward A. Bowers, Gifford Pinchot, Henry S. Graves, and others fighting for a chimerical dream when they vigorously opposed this principle of private acquisition and demanded that of the remaining public lands those which were suitable only for forest production should not be allowed to pass out of the hands of the national government? What motives actuated Presidents Harrison, Cleveland, McKinley, Roosevelt and Taft, all of whom exercised widely the power given them to make these reservations?

The idea which has moulded this entire national policy is that these public forests can be best protected and maintained in a productive condition under continued national ownership. It was held that under a policy of retaining these forest lands, the government could secure reforestation, protect watersheds, prevent fires, and require conservative methods of lumbering, thus preventing the waste and destruction of this national asset, to the permanent benefit of the public, while under private ownership these results would not be attained.

But merely to reserve and lock up these resources has never been the aim of conservation. "A wise demand for their economic *use*" correctly states the case. The real issue lies as to methods by which this use can best be perfected. The lumbering and manufacture of standing timber, the development of waterpower, and the use of other resources demand the investment of large amounts of capital and the establishment of a systematic business. Only three possible methods present themselves for accomplishing these ends, namely, the assumption of such investment and business activity by the government; the retention of ownership only by the government and the investment of private capital in the business, under lease or contract; or the sale and disposal of the property itself to the capitalists who desire to develop it. The first is State Socialism and has never been advocated by conservationists. The third is individualism and would utterly destroy this national policy. The second expresses the aims and goal of national conservation. But is it possible for the government to enter into business relations with private capital and to regulate the use of its lands by the terms of leases or contracts in such a way as not only to preserve the property

itself in the best possible condition, and insure the greatest benefit to the public, but at the same time induce capital to venture on large and prolonged investments which are entirely dependent on the guarantees given in such contracts, and on the interpretation placed upon their enforcement by public officials. Under the old order of political appointees, incompetent and often unscrupulous, the answer would be an emphatic negative. The new wine of public responsibility and efficiency would crack the old bottles and the effort would come to naught.

The solution of this problem was the creation of a new national service, for the direct purpose of coping with these new responsibilities and proving to the country that as a nation we were not incapable of rising to our opportunities. The best example of this is the Forest Service, in the Department of Agriculture, which was gradually built up partly by rigid competitive examinations in technical forestry, which required for passage the equivalent of five years of college training, and partly by appointment of local men as forest rangers on the basis of merit and examinations. A widespread system of forest schools sprang up, located in Washington, California, Idaho, Montana, Colorado and in eastern states, the graduates of which sought employment in this branch of the government service. The Yale Forest School alone has graduated over three hundred men, a large majority of whom are or have been employed in this national work. The writer desires to add that of this entire number, with most of whom he is personally acquainted, he has yet to hear of a single instance of dishonesty or favoritism in their administration of the national possessions.



HAUSER LAKE PLANT OF THE MONTANA POWER COMPANY

This plant, on the upper Missouri River near Helena, Mont., is one of six developments operated by this company on the Madison and Missouri rivers, of which one is operating under a Forest Service permit and two under permits from the Interior Department. The power developed at the plants of the Montana Power Company and associated companies supplies the general market throughout central and western Montana and is used principally in mining operations. It will be used to operate the trains of the Chicago, Milwaukee & St. Paul R. R. as soon as installation of the necessary equipment along the line of the railway is completed.

Many of these men have now had ten to fifteen years of continuous experience with the problems of public business, complex and diversified, which have presented themselves for solution during the development of the system of co-operative use of timber and other resources. In the ten years since 1905 the service has effected a complete change in the attitude toward the national forest administration of that portion of the public in the western states who have had occasion to use these resources, and who would be the first to criticize an unjust and unefficient system. They have established a reputation for honesty, impartiality and efficiency which goes far towards the final solution of even the most complicated questions of procedure. The result is that while the champions of private ownership have waged continuous warfare upon public reservations and have tried in every possible way to break down the system and to demonstrate its failure, the spirit of efficiency and emulation developed in the Forest Service has triumphantly solved the big problems of public administration in the face of and even aided by this opposition.

This is best illustrated by the timber sales policy of the Service. Lumbermen were at first bitterly hostile to the withdrawal of the timberlands, for timber was the raw material of their business, and its ownership in large quantities was the guarantee upon which rested the security for its continuance. The idea of being forced to purchase stumpage from the government, and to comply with new, costly and untried regulations, which compelled them to burn slash, leave part of the stand, and protect this residue from damage during logging, was offensive and aroused much indignation. But the operators have found that they could do all these things. The period of experimentation is past. Mistakes, due to inexperience, have been remedied. Today contracts are in force for billions of feet of timber, in which the operators are entirely dependent on the government for stumpage. The annual revenue from timber sales totals over $1,300,000, and the lumbermen of the west are practically united in support of the principle of national retention of the residue of publicly owned timber lands. The principle of co-operative use of national timber has stood the acid test of actual application.

In the use of the grazing lands included within national forests, an even more satisfactory development of business customs and regulations has occurred. Based on the principle of allotting the government range to those most entitled to it, and to the homesteader and resident in preference to the owner of large migratory flocks, the

Forest Service has built up both the condition of the range and the number of stock grazed, and at the same time has completely won over both sheep and cattle men to a whole-hearted support of the principle of national retention of these grazing rights. Throughout the length and breadth of the west there remains hardly a vestige of opposition to the grazing policy save on the part of a few who are not getting what they think they might secure under a return to the old policy of the right of the strongest, backed by the rifle, which formerly characterized the struggle for the public range.

These are facts which cannot be denied. So powerful has public opinion become in support of these national policies that big interests working through state and national politics to restore the good old days of free land grabs have again and again been driven to cover. The disruption of the national forests, desired as the surest method of exterminating the all too successful propaganda for retention of national resources has been widely advocated. Recently efforts have been made to show that the western states were staggering under unjust burdens of taxation as a result of the "retention" by the government of percentages of their area varying from 40 to 92 per cent of the total. (AMERICAN FORESTRY, page 820.) The author of these figures neglects to state what portion of these lands are *purposely retained,* and what percentage are now open for occupancy, thus permitting the public to believe that all such lands are forcibly held by the U. S. It must be made clear that not one acre of national forest lands more valuable for agriculture than for timber will be retained under present policies any longer than it takes to have it examined and thrown out, barring only the ranger stations and lands for similar public uses, and that the examination and elimination of *all* agricultural lands is being rapidly completed. National forests contain the *only large* bodies of land, exclusive of national parks, which the government intends to keep forever.* Indian reservations will probably in time be broken up, and allotted individually, pursuant to the declared policy of the Indian Office. The area of national forests amounts, not to 92 per cent, but to an average of not over 15 per cent of the total area of western States, the largest percentage being 33 per cent—practically all of which is worthless except for the timber it contains or for its capacity for timber production, grazing, or watershed protection. Mineral lands may be taken up and title obtained under the mining laws.* To those who would plead the necessity for local taxation as a reason for the breaking down of this national ownership of timber lands, the answer is clear. The only method of taxation which is considered perfectly just in the long run is a tax on income. Timber should in the future pay such a tax in lieu of annual taxes. But a tax of 20 per cent on net income is considered a fairly reasonable sum. The national government under existing laws pays to the counties within which national forests are located *a tax of 35 per cent of the gross income,* whether or not there is any net income whatever from the management of said forests. No private owner could afford such a tax, and annual taxes placed on such timber which would yield equal revenue would be confiscatory. Furthermore, this income will be perpetual, since the forests will be retained as productive areas, while under private management in many instances their productivity would be greatly impaired.

Had the principle of national retention of public resources in the west been wrong and the results detrimental, the entire system would long ago have been demolished by its enemies. It has stood and grown on its own merits until it is so firmly intrenched in public favor that the opponents of the national forest policy have been forced to fall back on state sovereignty as their last argument. And here they have no grounds to stand on, for the *western states as such have received as much, if not more, land from the nation than those located elsewhere,* and the U. S. Supreme Court as early as 1839 in Illinois, announced the absolute right of the national government to retain title and to lease such lands and resources as it chose, within the confines of a sovereign state.

The fight on the waterpower question is merely another phase of the struggle of the new and successful principle of national retention and leases as a means of developing public resources against the older and questionable plan of relinquishment of these properties to private ownership. There is but one answer to this question; the nation must retain the ownership of the waterpowers on public lands, and lease them on terms which will secure the greatest degree of utilization and benefit both to the investor and to the consumer.

*An exception must be made to these statements in the case of extensive areas of coal lands, the future policy for which has not yet been determined.

MARYLAND'S WOOD-USING INDUSTRIES

THE State of Maryland probably has a total of 500 industries which rely to a large extent upon wood for the manufacture of their products. Thirty-five per cent of these are centered in the city of Baltimore, the rest distributed over the State, but particularly numerous in the middle western part, and certain sections of the Eastern Shore.

The study of those in Western Maryland is completed, and in Baltimore it is well under way. The investigation has disclosed some interesting facts, and upon the basis of the data secured it is the intention of the State Forester to establish a State Wood Waste Exchange. It is of course not difficult to find manufacturers who have waste to sell; it is not as simple a matter to locate advantageous markets for them. However, it is believed that this part of the work will meet with reasonable success, and the manufacturers themselves are evidencing much interest in the present investigation. There exists among most of them a decided willingness to add to the efficiency of their plants through a better and a closer utilization of raw materials, and if hearty cooperation makes for the success of such work, that in Maryland should be productive of results.

Children's Department

Devoted to importing information about trees, woods and forests to boys and girls so that they may grow to know how necessary trees are to the health, wealth and future of their country.

By Bristow Adams

HOW TREES TRAVEL

OF COURSE a great tree does not move itself from where it has long stood. That is the best thing about it; it stands steadfast, its leafy crown reared aloft, in sun and rain. It may be beaten by the winds, or weighted down with snows, but still it holds its own, an example of courage and sturdiness. Indeed, it has been said that a full-grown tree is practically the only thing that man cannot put up where and when he wants it.

But the trees, as groups, must travel, or they could not live and spread out to occupy new places.

It is a well-known fact, and one that all foresters learn at the very first, that trees cannot thrive in dense shade. Foresters have a word for this quality of trees in respect to the demand for a place in the sun. They call it "tolerance," and say a tree will "tolerate," or stand, shade, or will not, in which case it is "intolerant." Some foresters claim that the reason smaller trees cannot grow under the limbs of others is not wholly because the light is kept off, but also because the larger and more numerous roots of the bigger tree rob the little one of all its moisture. No matter what the cause, the result is the same, and certain trees are not able to get a start unless they have a good open space to grow in. Others, the "tolerant" ones, can stand a lot of crowding and overshadowing; then, if light and freedom come they begin to grow thriftily even after they have been cramped and dwarfed for many years. The hickories, the sugar maple, and hemlock are examples of trees of this type. Yet even they do better if they can get their full share of light and moisture.

Thus it can be seen that if the trees dropped their seeds immediately to the ground beneath, the little seedlings, even if they were able to get a start, would have to struggle against the shade and the dryness caused by the parent tree, even though the greatest effort of the parent tree is spent in making possible the lives of new trees. So it seems as if some of the trees had thought out ways to scatter their seeds to a distance and had invented all sorts of devices, such as aeroplanes, parachutes, and even shotguns, like the witch-hazel's. Through the constant but very slow changes that have come about as a result of the success in life of those forms which have met the needs of the life struggle and have won out in this struggle—by means of the process known as evolution—the various devices have been made more and more perfect, until they seem to be the result of special plan and effort.

PRACTICALLY all of the pine seeds have wings. Those which do not have these filmy planes which bear them some distance from the tree on which they are borne, are valued as food by squirrels, and even by people, so their distribution is taken care of. The white pine cone opens at just the right time, and the little seeds from the bases of the cone scales go whirling away in spirals through the air. If you have even seen a single pine tree standing alone, with a whole brood of little trees, generally to one side, you may be very sure that these tree-children have come from the one parent, and that they are on the side away from the prevailing fall winds. Some pine trees release many of their seeds after the snow falls, and these seeds go scampering away with the winds, gliding and sliding over the crusted snow. Then when the warm spring sun comes, each black spot of seed, absorbing the heat, melts itself down into a hole and reaches the ground before the surrounding snow is all gone, and thus gets the benefit of the moisture from the melting, for the spring-time is near to start life.

One pine, the lodgepole pine of the Rocky Mountains, has been known to hold its seeds clutched fast in the tight little cones for a quarter of a century. Some cones have even been grown over by the limbs on which they grew and could never release their seed unless the branch or tree were destroyed. These seeds keep their life during all the years. Heat will open the cones, and a forest fire in this region is almost sure to be followed by a forest of lodgepole, because the fire not only opens the cones, but also destroys the litter on the ground so the seeds which are released can sprout at once on the soil left exposed. It is said that all the lodgepole pine forests represent areas that have been burned over, and they have been able to take possession because the other trees couldn't stand the fires, while the lodgepole was adapted to profit by them.

THE maple keys help the seed to float away from the parent tree. The aeroplane of the elm seed not only bears it on the wind but helps it float on the water. When the heavy spring rains come, the elm seeds which appear before the leaves in spring, and must soon sprout or die, are floated in quantities by the rain into pools or down streams, to find lodgement where some soil gives them a chance to grow.

Another device is used by the sycamore, or button-ball. Its seeds are ripened in the fall; yet the old tree does not let go of them, but holds them through all the winds of winter, where they hang on in spite of gales, even when the cord-like stems of the button-balls are whipped to shreds. But when the spring winds and rains come, the button-ball softens, and divides into downy segments; each seed, with its parachute, is whirled away in the gales of March.

The paddles of the ash tree serve their purpose, the little birds formed by the gray birch scales—all these are part of the same plan. Hemlock seeds are borne far out on the tips of the smallest twigs and each seed is provided with a scale that keeps it from falling directly to the ground. The linden seed has a plane or parachute, other seeds have hooks that catch to moving objects, and thus they travel. Some have special boats for floating, like the Chinese water nuts.

The cocoanut has traveled all the tropic seas, for its husk has an outer layer that is smooth and shiny and will not let water in, while just inside is a porous and fibrous mass, full of air spaces so that the heavier kernel is readily floated. Because of the so-called "milk" in the cocoanut the kernel keeps its life for a long time, until cast up on a beach by the tide, and half imbedded in sand from the beat of the waves, it sprouts in groves that fringe the southern oceans and even helps to establish soil on newly formed coral islands.

The common red cedar or juniper bears a seed covered by a pulp which is relished by birds. The birds digest this pulp, not the seed, which, passing through the bird's body, is carried from place to place. The fence-row lines of cedar trees have all been started in this way and mark where birds have stopped to rest on the fence rails or wires. Foresters have found that the only successful way to get red cedar seeds to sprout is to practically boil them first and remove the pulp, or in other words, to imitate the conditions within the birds' hot little bodies.

CHESTNUTS, hickory nuts, walnuts, and other edible seeds relished by squirrels and mice are buried by these animals. Naturally they forgot some of these storage places, or do not need to use all that they have hoarded. Here again another wise provision of nature comes in. The shells protect the germ until after the winter has frozen and cracked the outer protective covering, admitting the moisture when the spring thaws come and cause the germ to swell and grow.

Most remarkable, in many ways, is the witch-hazel, which grows in dense thickets and must spread its growth outside these thicket boundaries. It has a regular artillery. The nuts seem to need a sharp frost to open the closely joined parts. Frosty nights will do the trick, and a dry, sunny day completes the process. Warmth causes the edges of the seed cups to curve inward with such force that the seeds will be shot for a considerable distance, usually from ten to twenty feet, though an actual measurement of forty-five feet is recorded. The special provision in the case of the witch-hazel seed is that the seed is very smooth, and polished, and the way the seeds are discharged is like that by which orange or watermelon seeds are shot by the pressure of thumb and forefinger.

These examples of the way trees travel by means of their seeds are only a few of many. Can you think of others?

DIRECTORS MEET IN NEW ENGLAND

DIRECTORS of the American Forestry Association met at Boston on August 31 and at the Profile House, N. H., on September 1, in order to present at the Forestry Conference at the latter place

the views of the Association on the extension of the appropriation for carrying on the program of acquiring forest reserves under the provisions of the Weeks Law, and to decide where to hold the next annual meeting.

Boston, backed by the Massachusetts Forestry Association, made an earnest appeal for the meeting and it was decided to hold it there early in January, the date to be announced later. There has long been a demand from the many members of the Association in New England for a meeting there and as all throughout that section there is a desire to continue the purchase of Federal forest reserves, and as the Association is so active in keeping before the public the necessity of completing the original program of acquiring 5,000,000 acres in the Southern Appalachians and 600,000 acres in the White Mountains, the meeting in January will be particularly appropriate occasion for discussing the situation as it will be at that time.

It is planned to hold a two-day session, with a public banquet on the evening of the first day and to have programs of addresses and discussions at the morning and afternoon sessions each day.

During the stay in Boston the directors were the guests of the Massachusetts Forestry Association on a visit to the Arnold Arboretum, through which the party was conducted by Prof. John Jack whose lucid descriptions of what has been accomplished there and what work is planned for the future were much enjoyed. The party was escorted about the city by Secretary Harris A. Reynolds of the Massachusetts Forestry Association.

At the Profile House, President Henry S. Drinker, in behalf of the American Forestry Association, presented its plans in relation to advocating an additional appropriation of $10,000,000 to be expended during the next five years in acquiring Federal forest reserves, and invited the organizations represented at the meeting to cooperate. This invitation was accepted with enthusiasm. Senator Weeks, father of the Weeks Law, told, in an interesting reminiscence, of the long-continued efforts and final success in securing the passage of the law, and of the efficient manner in which the law has been administered, during the past five years. He also gave some valuable advice regarding efforts to secure a continuation of its operation.

The Forestry Conference consisted of several sessions during which there were addresses and discussions on various phases of forestry, including addresses by W. R. Brown, president of the State Forestry Commission, on forest progress in New Hampshire; by Prof. H. H. Chapman, of Yale Forest School, on the woodlot from the foresters' point of view; by Dr. Kenyon L. Butterfield, president of the Massachusetts Agricultural College, on the place of forestry in a rural policy; and the discussion on this topic was taken up by Commissioners of Agriculture from various New England States; by John C. Orcutt, secretary of the Agricultural Committee of the Boston Chamber of Commerce, on the cooperative marketing of woodlot products; by Herbert Welsh, of Philadelphia, on cooperation at Sunapee; by Hon. E. E. Woodbury on progress at Lost River; by Prof. J. W. Toumey, director of the Yale Forest School, on the woodlot at home and abroad; by William L. Hall, assistant United States Forester, on the national forest in the east, and by Miss Eloise Gerry, of the U. S. Forest Laboratory at Madison, on some suggestions in wood technology.

An excursion by automobile through the national forest on Lafayette Mountain and a tramp on foot over the skyline of the Appalachian Mountain Club and an excursion to Lost River marked the outings of the party.

A FORESTER'S CHIEF TASK

By Alfred Gaskill

Director of the American Forestry Association

THE chief task of a forester is to localize and to specialize his efforts—always looking toward the future. Above all he must educate his public in economics and through that, not apart from it, lead to the practice of silviculture. The store of virgin timber is

ALFRED GASKILL
State Forester of New Jersey and Director of the American Forestry Association.

the dominant factor in the lumber market. As that is reduced lumber prices will approach the cost of production. The sections which use most wood and have the least reserve offer the best opportunities for practical forestry.

It is important to realize that timber is accidentally, not essentially, a product of the wilderness. The most profitable forests are always close to populous centers for the same reason that low grade lumber is more salable in New York than high grade is in San Francisco or New Orleans.

True forest conservation will give serious thought to the degraded woodland areas in the eastern States. They can be made to yield a double harvest—one of wood, another of human uplift.

TWO NOTABLE OAKS

By J. R. Simmons

IN FRONT of the Wayside Inn, on the State Road, in Sudbury, Mass., about 20 miles west from Boston, stand these two mighty white oaks, measuring 18 feet 2½ inches and 17 feet 7 inches in circumference, respectively, and spreading their powerful branches over a space of about 225 feet.

THESE OAKS SAW WASHINGTON PASS

Under their branches the father of his country passed on his way to Cambridge to take command of the Continental Army.

Here they stood in June, 1775, when Washington passed on his way to Cambridge to take command of the Patriot army; and again, nearly a century later, their silent grandeur attracted the eye and appealed to the heart of Longfellow, who made them famous in his "Tales of a Wayside Inn."

"Through the ancient oaks o'erhead,
Mysterious voices moaned and fled."

They stand as witnesses of a long series of historical events reaching back over a period of years previous to the coming of the first European settlers. The oldest citizens in their vicinity claim for them an age of upwards of 1,000 years. Certainly in appearance they would seem to bear out the tradition.

The tree on the left of the picture has not succeeded in preserving its history by means of radial rings. Its trunk is hollow, and, by entering through an opening on the side furthest from the road, three persons might stand upright within. The other oak is comparatively sound, and when death comes a cross section will undoubtedly record a very long and interesting life.

The measurements given were made in the early spring of 1915.

STATES GET $850,000 FROM NATIONAL FORESTS

THE portion of the National Forest receipts for the fiscal year 1915 to go to the benefit of the various States in which the forests lie, according to the computation of the Forest Service just approved by the Secretary of the Treasury, amounts all told to more than $850,000. The gross receipts for the year ending June 30 were $2,481,469.35, of which under the law 25 per cent is paid over to the States for county school and road purposes and an additional 10 per cent is made available for expenditure by the Secretary of Agriculture in building roads and trails for the benefit of local communities.

Montana gets the largest share, having contributed the largest amount of receipts for the sale of timber, grazing, and other uses of the forests, or more than $318,000. Of this amount, Montana is to receive $79,589.78 for county school and road purposes, while the Forest Service will expend $31,835.91 for improvements of special benefit to local communities and not included in the regular administrative and protective improvements. Idaho comes second with a 25 per cent allowance of $75,651.15 and a 10 per cent fund of $30,260.46. California is third, receiving a 25 per cent allowance of $67,611.37 and a 10 per cent fund of $27,044.74. The other National Forest States follow in the order of the size of their respective shares.

Arizona, $59,807.89, under the 25 per cent provision and $23,923.16 under the 10 per cent; Colorado, $59,218.60 and $23,687.44; Oregon, $49,675.83 and $19,870.33; Utah, $48,675.96 and $19,470.38; Wyoming, $43,086.86 and $17,234.75; Washington, $37,445.56 and $14,978.23; New Mexico, $31,786.46 and $12,714.58; Nevada, $16,244.53 and $6,497.81; South Dakota, $12,988.11 and $5,195.25; Alaska, $11,165.75 and $4,466.30; Arkansas, $8,738.93 and $3,495.57; Florida, $2,336.77 and $934.71; Minnesota, $1,971.60 and $788.64; Nebraska, $1,401.15 and $560.46; Kansas, $1,357.33 and $542.93; Oklahoma, 759.77 and $303.91; Michigan, $198.37 and $79.35; North Dakota, $81.83 and $32.73; Porto Rico, $9.25 and $3.70.

The States of Arizona and New Mexico receive additional shares for their school funds on account of school lands included within the National Forests, yielding them $28,966.46 and $9,311.87 respectively.

On the National Forest Purchase Areas in the East, a total of $3,977.60 was collected in Georgia, New Hampshire, North Carolina, Tennessee, Virginia, and West Virginia, these States thereby sharing $994.40 under the 25 per cent provision and $397.76 under the 10 per cent.

The total amount to be expended under this system of sharing the Forest receipts with the States to make up for the loss of local taxes due to public ownership of the land is about $16,000 greater than for the previous fiscal year, as the receipts for the fiscal year 1915 exceeded those of the previous fiscal year by about $44,000. The provision of law under which a portion of the receipts is turned over to the States dates from 1906, and the total payments reach, with this year's allotment, nearly $4,500,000. The 10 per cent provision for government-built public roads has been in force only since 1912, and has now made available for this purpose an aggregate of $926,000.

CALIFORNIA'S TREE COLLECTION

ONE of the largest collections of rare trees, representing countries in all parts of the globe, is that maintained by the State of California in the large and beautiful park surrounding the capitol building in Sacramento. Here one will find not only scores of varieties of coast trees but visitors from afar like the white mulberry from Asia, the variegated euonymus from Japan, the Rose of Sharon from Syria and the silver wattle from Australia.

Chili has a representative in the monkey puzzle tree, other wise the *Araucaria imbricata,* that peculiar member of the pine family which takes its name from the fact that its crowded and twisted branches are said to puzzle the monkey which would seek to climb it. From Brazil was brought the lemon verbena, while from distant Persia there came the walnut.

Europe has a number of trees in the State's collection, including the Aleppo pine, the sweet bay and the hawthorn. The graceful Irish yew lines one of the walks leading to the capitol, with century plants alternating.

IRISH YEW

These graceful trees line one of the walks leading to the capitol of California at Sacramento.

To the visitor from the north and eastern States the butternut tree and the sugar maple have a familiar look, and there are other varieties that make southerners feel at home as they stand beneath their branches. In all,

THE MONKEY PUZZLE TREE

This is a peculiar member of the pine family from Chili, aptly named because it is said the crooked and twisted branches make it a puzzle for monkeys to climb.

Capitol Park contains some 500 kinds of trees and shrubs, and many students of arboriculture visit it to see the various species in leaf and blossom.

40,000 GET FREE TIMBER

OF THE 688,922,000 board feet of timber cut on the National Forests during the fiscal year ended June 30, 1915, according to statistics just compiled by the United States Forest Service, 123,168,000 feet were taken under free-use permits given to settlers and others living in or near National Forests. There were 40,000 free-use permittees, and the value of the timber they cut was $206,464.13.

Montana leads the National Forest States in the amount of timber cut under sales, with more than 101,000,000 feet, but takes second place in the free-use cut, with 18,000,000 feet. Idaho leads the free-use list, with a cut of nearly 25,000,000 feet, and is a close second in the amount of timber cut under sales contracts, with over 100,000,000 feet. Oregon, Colorado, Washington, Arizona, California, Wyoming, Utah, New Mexico, and South Dakota, in the order named, contributed from 60,000,000 to 24,000,000 feet under both free use and sales. The middle western and eastern National Forest States furnished relatively insignificant quantities.

Ornamental and Shade Trees

A Department for the Advice and Instruction of Members of the American Forestry Association

EDITED BY J. J. LEVISON, B. A., M. F.

Arboriculturist Brooklyn Park Department, Author of "Studies of Trees," and Lecturer on Ornamental and Shade Trees, Yale University Forest School

How to Plant a Shade Tree and How to Care for It the First Few Years

THERE has been considerable good literature published in recent years on the planting of shade trees. It is timely to quote some of this from the following tree sources which will cover the most important points of the question.

The office of the Commissioner of Forestry of the State of Rhode Island publishes the following on "How to Plant Shade Trees":

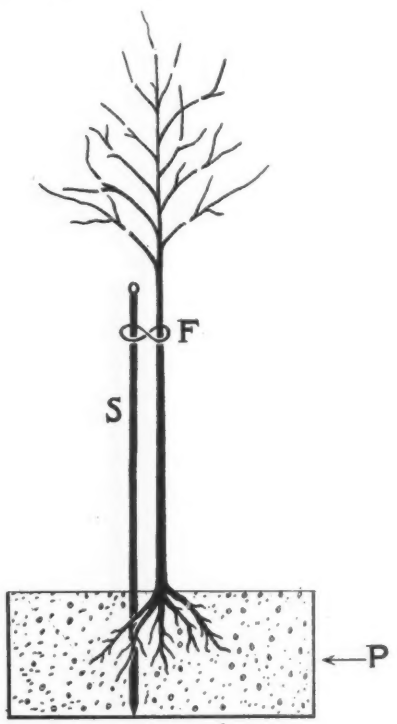


Diagram of Tree
P = Tree Pit 6'x5'x2½ deep
S = Stake; F = Fastening
= Pruning for Transplanting

"Many trees are destined before planting to an early death through lack of precautions in their digging and transit. Removing a tree from its original site and planting it in a new place is a surgical operation requiring a knowledge of plant physiology. To grub out trees and plant them in small dry holes invites wholesale failure. Of a lot of vigorous trees suitably planted, nearly every one should live and thrive.

"In digging trees care is required to preserve a large number of the tender root-tips and fine rootlets which supply the water and mineral food. A small tree—an inch or two in diameter—growing near the place of transplanting, may be lifted with a ball of earth in which the root system is imbedded, wrapped in burlap, and carried to the pit prepared for it. To secure shade without loss of time, trees six or more inches in diameter are sometimes transplanted with full ball of earth—an expensive operation requiring special appliances. Trees sent out by nurseries are usually lifted without balls of earth and skilfully packed for long-distance shipment. Upon arrival from the nursery, unpack the trees and set them in small trenches in a shady place, covering the roots with moist earth. Trees dry and hot when received are not likely to live, but some species will stand more maltreatment than others. Wild seedlings from the field and woods may be used, but nursery stock is preferred. When ready to begin work, remove the trees from the trenches, cover the roots with moist straw or burlap and carry them to the tree-pits and plant. At no time must the roots be much exposed to the sun and wind.

"The cost of planting varies with the size of tree, soil and site. The Beacon Street planting in Boston recently done successfully under the direction of a landscape architect, cost $50 a tree. This work involved the planting of 150 European lindens, 2½ inches in diameter, a system of sub-irrigation by means of Akron pipes laid with open joints among the roots, the digging of tree-pits 12 feet long, 4½ feet wide and 3 feet deep, the removal of the excavated material, the filling of each pit with 4 cubic yards of rich loam, relaying the sidewalk, tree guards, and maintenance for two years. In country and suburban districts and in favorable city locations, the cost would be much less than the above named figure.

"Street trees are usually spaced 30 to 50 feet, according to species; 40 feet is a good distance; large trees like oak, elm, sycamore, and black walnut require wide spacing—

50 to 70 feet. Where trees and shrubs of varying foliage and tolerance of shade are mixed in groups for landscape effects, the spacing is closer—often 5 to 20 feet.

"The hole should be dug wider and deeper than seems necessary—perhaps 2 or 3 feet deep with an area of about 30 square feet for 2-inch trees, in order that the growing roots may have a sufficient amount of loose rich soil. If the soil from the pit is not good, it should be replaced with rich loam or forest humus free from sticks and stones. The tree should be planted to the same depth at which it stood in its original site, or perhaps an inch or two deeper if set in light porous soil; the root collar indicates the right depth. Fill in the center of the hole with earth to the height at which the tree is to stand; then place the tree on this slight elevation and spread out the roots in a natural manner. While an assistant is covering the roots with the first thin layer of soil, the tree may be moved up and down within the space of an inch, in order to firm it in place and to bring the soil into close contact with the roots; then as the hole is gradually filled, the soil is pressed down carefully but firmly to prevent drying out, the last shovel full being thrown loosely over the surface. A heavy man with large feet makes a good planter. Water is useless excepting in dry loose ground.

"Before planting, any broken and bruised roots should be removed with a sharp knife, the face of the cut being made on the under side of the root. The loss of roots must be balanced by pruning of the top in which crooked branches are removed and spindling twigs shortened. A straight and vigorous leader uncut gives the tree a long conical crown; if cut, a short compact crown. The beanpole style of planting without any top is not advisable excepting in special cases where the root structure has sustained much injury; since rapidity of growth depends on leaf surface, topping is a serious set-back, but good sprouters like willows and poplars will survive such mutilation, and these short-lived trees are recommended for planting where rapidity of growth and shade is the chief consideration.

"A thin mulch of leaves, or litter mixed with fertilizer will keep the ground cool and free from weeds which would transpire the moisture needed by the young tree. A stake driven into the ground and fastened to the tree by a twine inclosed in a piece of rubber tubing prevents wind-throw. The market affords various kinds of tree-guards against injury by animals. Young beeches, maples, horse-chestnuts and others subject to sun-scald are protected by neighboring shade or by lattice south of the trees. Planting may be done at any time, but from April 1 to May 10 is the most favorable season in Rhode Island.

"The choice of species is a large topic outside the scope of this essay, but it may be said that adaptability is essential. Sidewalks require clean, hardy, symmetrical, long-lived species of moderate size like Red Maple, Norway Maple, Hackberry, and Ironwood. Wide avenues admit the more majestic trees, like the Oaks, Basswood, Tulip, Chestnut, Rock Maple and Liquidambar. Uniformity of spacing and species is effective in a street. On lawns, variety of species lends accent to diversity of topography, and charm through the countless tints of bud, leaf, and flower in springtime, and the fine array of brilliant foliage in autumn. For dense shade, use Beech and Maple; for thin shade, Ash."

SPECIFICATIONS FOR SHADE TREE PLANTING

The Brooklyn Park Department, in permitting citizens to plant a shade tree, sets up the following specifications:

"1. The tree to be at least 2½ inches in diameter, one foot from ground.

2. To be straight, to have a compact fibrous root system and a well-balanced head.

3. The trunk of the tree to be free from branches to a height of at least 7 feet from the ground and the first branch to be not over 9 feet from the ground.

4. The tree to be free from disease and injurious insect pests.

5. The tree hole to be not less than 3 feet square and 3 feet deep.

6. One to three cubic yards of good mould to be placed in each tree hole, according to the conditions governing the location.

7. The tree to be planted at the same depth that it stood before transplanting.

8. Wherever possible, trees should be planted not less than 25 feet apart. Thirty feet is preferable.

9. The tree to be watered and surface soil raked or cultivated at least once a week in dry weather, and otherwise to be properly cared for by the owner of the premises, at his own expense and to the satisfaction of the Department of Parks.

10. The work of planting to be done under the direction and to the satisfaction of the Department of Parks, or its proper representatives, and subject to the rules, regulations and ordinances of the Department of Parks.

11. A tree guard of approved pattern, or wire guard of small mesh, to be placed around the tree by the owner of the premises.

12. The most desirable trees for general street planting are the Norway Maple (*Acer platanoides*) and Oriental Sycamore (*Platanus orientalis*). For suburban sections there are other equally suitable trees, and for information on these consult this Department. The Poplars, Silver Maple (*Acer sacharinum, Linn.*) and Sycamore Maple (*Acer Pseudo-platanus*) are not desirable for street planting."

THE CARE OF SHADE TREES

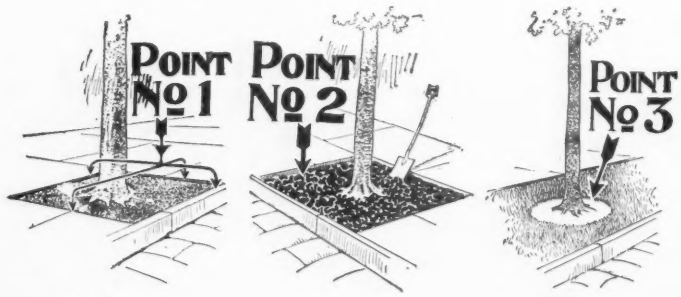
Mr. Carl Bannwart, of the Newark Shade Tree Commission, admirably presents the main points in the "Care of Trees" in the following way:

"Every boy and girl has his or her good points. So has a horse. So has a tree. The good points of a horse and those of a boy are much the same. The horse must have vim, be bright, be well-proportioned, clean-limbed. The boy must have vim, must be bright, must have a good set of muscles. The good horse has a pleasing color and a glossy coat and must hold his head high.

So with the boy; he must be well-groomed, must stand erect; and moreover, must see things when he looks at them. The good horse must walk, gallop, trot, or stand as the master directs. So the boy must learn to walk, run, caper or be still as the case requires.

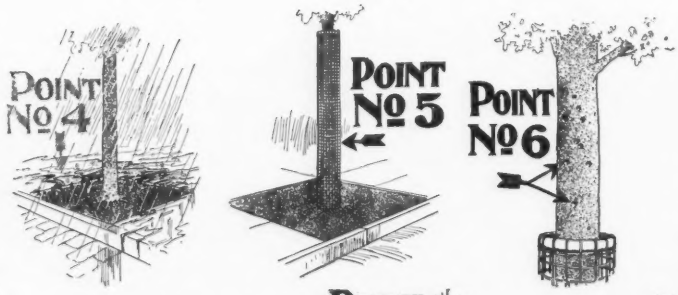
"And the tree has as many good points, although they are different. Examine your tree for points every month and see what percentage it will have out of a possible one hundred. Here are some of the signs which show whether the tree has a college diploma, is cultivated, is familiar with the higher branches. Each question, if answered unequivocally, 'Yes,' gives your tree $8^1/_3$ per cent toward the one hundred. These questions are put in the order of their importance; and are numbered to correspond with the pictured 'Points.'

1. Is the opening around your tree of standard size?* (What is the actual size?)



2. Is the ground in this opening well-loosened to admit air and water?

3. If the tree is surrounded by grass, is the sod open around the trunk?



4. Does the tree get a good proportion of the rain which falls on the sidewalk, or does it run over the curb into the gutter?

5. Is the tree protected with a tree-guard? Guard must be six feet high and not too tight. Tree must be protected from chafing by guard.

6. Is the tree free from borers? Borers can be detected by sawdust coming out of holes in the trunk. Watch for the borers from April to November.

7. Are the trunk and the branches cleared of all cocoons, egg-masses, larvae, caterpillars, beetles, scale?

8. (*a*) Is the head free from all deadwood, has it been pruned by an expert, and how do you know he is an expert? Find out how a tree should be pruned. Are all the cuts painted? (*b*) Does the tree stand perpendicular and is its present place intended to be its permanent home?

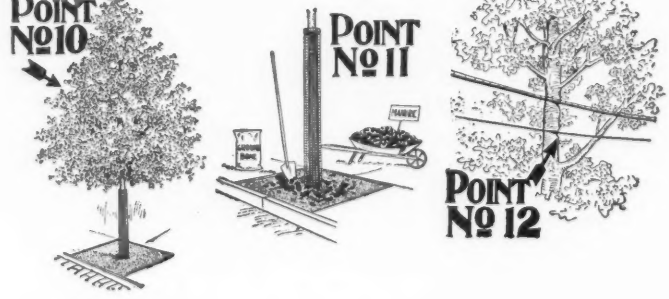
9. Have the scars from horse bites or other injuries been cleaned out and painted to prevent harboring insects and to stop decay? If there are large cavities these should be filled with cement.

10. Does the tree remain green and in full leaf to the middle of October?

11. Have you put as much nourishment into the soil as the tree needs for the year? Give it a treat; dig in wood ashes, ground bone or well-rotted manure.

12. Are any wires interfering with your tree either by swaying or by electric current? Are there any gas leaks?

"Here are the twelve points of a good street tree. The total percentage if below par reflects on the man, not on the tree. The tree always does its best. Man forgets that he has taken it out of the God-made forest where it could and did care for itself, and has placed it in a man-made city where it is dependent on man's care for thrifty growth."



*Standard size is: 4 feet square for a tree of 6 inches (or less) diameter; for every 1 inch increase of such (6-inch) diameter, an increase of 1 square foot in area of opening.

WHY THE POPLAR, SILVER MAPLE, AND AILANTHUS SHOULD NOT BE USED FOR GENERAL PLANTING.

There is a very popular but erroneous idea current that the poplar is the best tree for planting. The reason for this wide-spread idea can be found in the quality of quick growth which the poplar possesses, and which the average citizen evidently considers of supermost importance in choosing his tree. The

fact, however, is that even this fast growth itself soon becomes a most serious objection against the poplar, because the tree grows so rapidly that it soon becomes top-heavy, and the wood being soft and brash, breaks of its own weight. The main roots of the poplar grow very large and upset the pavement of the sidewalk, while the finer rootlets in their search for water extend themselves to the nearest water or sewer pipes, penetrating the cemented joints of these, and in course of time develop sufficiently to clog up the passages.

The conventional outline of its form and its system of branching as well as the stiffness of its foliage does not

LOMBARDY POPLAR

This tree has a special landscape value which no other tree possesses and under special conditions it can be used to better advantage than other trees.

even recommend the poplar as a beautiful tree. Its leaves begin to drop earlier than those of most of our other shade trees and the flowers of the male trees during their period of falling cause much discomfort to pedestrians. It is a tree that requires constant trimming, possesses a very short life and is frequently destroyed by scale insects and borers. The city government in Albany, N. Y., in 1871, not only forbade the planting of the poplar, but also compelled its removal from the streets at the time this ordinance was passed.

In Washington, D. C., in Brooklyn, N. Y., and in most other cities where the care of the city trees is charged to some special authority, the poplar is not tolerated. The species which is most commonly planted and to which these remarks apply more directly is known as the Carolina poplar. But there are three other kinds frequently used—the Silver, Lombardy and Balsam poplars, and most of the defects enumerated above are equally applicable to all.

A CAROLINA POPLAR

Many believe that because of its quick growth the poplar is desirable for street planting. It is not, however, as its roots, which grow large, are likely to do much damage to the pavements, while the finer roots, in their search for water, extend themselves to the nearest water or sewer pipes, penetrating the cemented joints of these and sometimes clogging up the pipes.

There are occasions, however, under special conditions, where the poplar may be used to better advantage than any other tree. The Lombardy poplar, for instance, has a special landscape value that no other tree can produce. The Silver poplar is very desirable for seaside planting and the Carolina poplar is so well adapted to

factory districts and poor atmospheric and soil conditions that it is often better to have that tree than none at all.

The Silver maple is very pretty in its mode of branching and grows rapidly, but in most respects is as undesirable as the poplar and more subject to dead wood and injurious insects.

The ailanthus like the poplar has the advantage of being able to grow where few other trees will grow. Moreover it is well formed and straight. The serious objection, however, is the brittle character of its wood which causes frequent accidents, especially in wind storm. It is short-lived and has a tendency to become hollow when it reaches a diameter of about 2 feet or over.

For special use under special growing conditions all these trees may prove of great value but for general planting in large numbers on city streets their disadvantages should be considered with the utmost regard.

ADVICE FOR OCTOBER

1. Prune all dead branches before the leaves fall.
2. Mark for removal, all trees hopelessly infested with insect pests that are liable to become serious enemies in a locality. Such pests as the hickory bark beetle in the hickories, and the bronze birch borer in the birches are examples.
3. Collect and burn the egg masses of the Tussock moth and destroy the eggs and cocoons of other insect infestations.
4. Spray for scale insects; but before doing this, determine the character of the insect and receive specific instructions from your local State entomologist or from the United States Department of Agriculture. Do not spray sugar maples with oils.
5. Treat cavities before freezing weather sets in.

QUESTIONS AND ANSWERS

Q. Should Lombardy poplar trees be trimmed around the lower part of the tree or should the growth which starts from the ground, that is the branches, be allowed to grow, for, seemingly, by doing so they withhold from the upper part of the tree the strength needed.

C. F. Q., *Center Harbor, N. H.*

A. Lombardy poplars are only *beautiful* and *natural* when the branches are allowed to grow thickly from the very bottom to the very top. The little branches should *never* be trimmed around the lower part so as to bare the stem. When a Lombardy poplar begins to thin out or grow old, the best thing to do is to cut off a great portion of the top, varying with the size of the tree, and cutting back all the little branchlets along the whole surface of the tree. I do not mean to cut any of these off entirely, but just to remove a part of them, half or more, according to the condition of the tree. After cutting the form of the tree should be uniform. The harder and the oftener the Lombardy poplar is cut, the faster and the thicker it will grow. You can cut the tree at any time from now on until the buds begin to open in the spring. September or October, however, are the best months for doing this work.

Q. Have you, or do you know of a successful transplanting of large oaks? What are the chances of success in moving oaks 2 inches in diameter as compared with elms, maples and like fibrous rooted species? I have a problem with a virgin live oak (*Quercus agrifolia*) and shall appreciate any information you may give me.

N. C. T., *Oakland, Cal.*

A. Oaks from 2 inches to 4 can be readily transplanted with little difficulty and with fair chances of success. Trees of larger diameter, up to 14 inches, have been transplanted with more or less degree of success; but in each case the work has been done with special lifting apparatus and by men who more or less specialize in this sort of work. I would suggest your writing to Messrs. Isaac Hicks and Sons, Westbury, L. I., who are about the largest tree movers in this section of the country and who will undoubtedly send you their catalogue and other information along these lines.

Q. When will it be advisable to plant the following trees, in a situation in the southern part of Cayuga County, N. Y.: English Thorn, American holly, hawthorn, Swiss Mountain pine, Rhododendron, Fringe tree, Korean pine, Giant Arbor Vitae, Linden, and one each of the following: White pine, pitch pine, table mountain pine, Austrian pine, Scotch pine, nut pine, fox-tail pine, lace-back pine and needle pine.

M. C. C., *Venice Center, N. Y.*

A. Plant in the spring of 1916. About the beginning of April. You can plant in September, but spring is preferable on general principles.

Q. I am sending you specimen from a Dogwood that I have in my yard. This blight seems to be affecting the whole tree. Can you advise a remedy?

A. The premature turning of the dogwood leaf and its dry condition shows that the tree is suffering from too much exposure or too little water. Dogwood naturally grows best in deep woods where the moisture from their leaves does not evaporate as readily as in exposed places, and where their roots can find plenty of moisture. There is no evidence of disease. Would suggest cutting back the tree lightly this fall—not cutting out any branches entirely but just cutting back from the ends. Dogwoods respond to this treatment well. Also cover the tree with a mulch of leaf mold late in the fall.

The Philippine Forestry Exhibit

By Arthur T. Fischer.

THE Philippine Forestry Exhibit at the Panama-Pacific Exposition in San Francisco is the largest exhibit of its kind there, occupying 10,000 square feet of space and displaying some 450 different species of wood in panels and samples.

The main features are 10-foot panels of varying widths, covering 260 feet of wall space and representing 131 species of woods; and manufactures of different woods, such as furnitures, floors and interior finish for which there is an export market and which can be furnished in commercial quantities. All the materials inside of the allotted space used in the installation of the exhibits and booth construction are of Philippine woods or forest products and have created much favorable comment.

THE MINOR FOREST PRODUCTS SECTION

In this section there are on exhibit in many forms gum copal, resins, gutta percha and rattan, all products of the Philippine forests which are well worth careful inspection.

About one-third of the area of the Philippine Islands, that is, 40,000 square miles, is covered with virgin forest, with a stand conservatively estimated at 200 billion board feet, of which 142 billion belong to the Dipterocarp family of which the lauans are in the majority. Ninety-nine per cent of all this timber belongs to the Government and is under the administrative control of the Bureau of Forestry.

The entire administrative and investigative work of the Bureau of Forestry is shown. It is very interesting to note the progress along investigative lines made during the American occupation; in 1900 only about 400 species were known and the botanical and wood collections made by the Bureau employes number about 26,000 up to 1915, out of which the number now identified is 4,200 woody plants and 2,200 tree species, of which about 1,000 are timber trees. On an area of 120,000 square miles the Philippines have four or five times as many species as the entire United States.

A woodman from temperate regions is usually very much bewildered and often discouraged when he first realizes the very great number of forms with which he has to deal in the Philippine forest. He cannot work long in the forests before he discovers that the bulk of the stand is made up of comparatively few species.

With the great number of forms occurring in the Philippines it is very natural that the problems of silviculture and management are correspondingly increased over the problems in the temperate regions, and it is just this fact that makes a forester's work in the tropics so much more interesting. In 1911, the investigative work of the Bureau of Forestry was centered at the Forest School at Los Baños, Laguna, on the lower slopes of Mt. Maquiling, about 25,000 acres of which are forested and included in the Government reserve. This makes not only a splendid laboratory for the students of the Forest School but also a splendid area for research and investigation. Extensive studies of growth and reproduction were started, measurement of the rate of growth of hundreds of trees in the forest and of many more in the nurseries and plantations were taken. To date 317 species have been handled in the nurseries and 83 species set out in permanent plantations. A number of these species offer promise as successful plantation crops.

As a result of the scientific work done by the Bureau and those who have cooperated with it the following things have been accomplished.

1. Mapping showing the location of the principal forest areas of the Islands.

2. Recognition of the fact that the principal forest wealth of the Islands is in the woods that occur in quantity and not in a few rare cabinet woods.

3. Detailed study and classification of the important timber trees.

FURNITURE AND KIOSK AT PHILIPPINE EXHIBIT

The floor is of Philippine hardwood and the entire exhibit is made of the forest products of the islands, with the exception of the shell frieze work, which is made of capiz shell.

4. Classification of the commercial woods.

5. Determination of the durability of a number of woods by systematic tests extending over a period of years.

6. Determination of the strength of the generally used woods by mechanical tests.

7. Discovery of a successful crop for firewood and reforestation purposes.

8. Scientific study of the Dipterocarp forests.

One of the exhibits along the administrative lines is the system of communal forests which the Bureau of Forestry has put into effect. Each municipality having Government forest land in its vicinity can upon application have an area set aside for a communal forest, the size of the tract depending on the number of inhabitants and the stand of timber.

THE TEN-FOOT PANELS ON THE WALLS

There are 260 lineal feet of these panels, each 10 feet long, and they represent the various commercial timbers cut from the magnificent forests of the Philippines.

The Philippine Forestry Exhibit does not confine its display to woods alone but many products are shown which are classified as minor forest products in the Philippine Islands; they cover a wide range of products not cultivated but growing wild, the principal ones being Nipa, Rattan, Gum Copal, or Manila Gum, Mangrove barks for tanning, Gutta Percha, Dye-woods, Wood and Vegetable Oils, Bamboo for paper pulp, etc.

Nipa is a palm on the tidal flats along the seacoast; areas varying in extent up to 20,000 acres are not uncommon. Its leaves have great use locally for thatching but the sap is of importance to the commercial world, it having the distinction of being the cheapest raw material known in the world for the production of sugar, alcohol and vinegar.

Rattan is a product of many species of climbing palms found in the tropical regions of the old world. The large range of sizes makes the product adaptable for many uses. The Islands produce about 15 or more species and there is no finer rattan in the world than in the Philippine Islands. Its uses in furniture, baskets, car seats, etc., are too well known for further comment. One complete section is given to the display of this product showing the various kinds, and its varied uses are shown by artisans at work. This is the largest exhibit of its kind on the grounds.

Gum Copal, or Manila Gum, is shown in commercial packages as exported to Singapore and Europe and classified as to grades and kinds. It is the most complete as well as the largest exhibit of varnish gums and resins in the entire exposition. Other gums and resins are also shown, including the famous Manila Elemi, a source of certain drugs and perfumes which is only produced in the Philippine Islands and exported to Europe. Lumbang Oil, which is on display, is practically identical with the Tung Oil of China and could be developed to a big scale in the Philippines. The United States imported more than $2,000,000 worth of this oil from China last year.

Gutta Percha and Rubber, while not as large a display as the Gum Copal, are nevertheless comprehensive enough

to give the visiting public and the American manufacturer in particular a good idea of the grades and qualities of these products as produced in the Islands. Mangrove bark, from which the tanning extract, known in the commercial world as cutch, is produced, can also be seen; 800 square miles of mangrove swamps are available for tan bark extraction and make an attractive source of supply for tanning extracts.

A small, rather inconspicuous exhibit of Boho Bamboo is shown, the source of one of the finest and best paper pulps in the world. Thousands of acres of this bamboo are available for use. This bamboo, after being cut, sprouts and is ready for cutting every three years. The fiber and quality of this material can be seen and examined in the wall covering known as "Sauale" which is woven with splints of Boho Bamboo.

Many more products can be seen which will interest the American business men.

These facts about the Philippines may be of interest:

Number of islands, over 3,000.

Total area, 120,000 square miles, about the size of the State of New Mexico.

Population, between 8,000,000 and 10,000,000 people.

Area now cultivated estimated at 6,000,000 acres.

Area suitable for cultivation estimated at 30 to 35 million acres.

Virgin Forest area estimated at 25 to 30 million acres.

Second growth area estimated at 15 to 20 million acres.

EXHIBIT TAKES GRAND PRIZE

Just as this number goes to press a report from San Francisco to AMERICAN FORESTRY says: "The Philippine Bureau of Forestry exhibit at the Panama-Pacific exposition has captured the grand prize for the best forestry exhibit in the entire exposition. This is the highest honor within the power of the exposition officials to award. Moreover, the exposition officials consider the exhibit of such unusual excellence that in addition they have awarded to the Bureau of Forestry two other grand prizes, three medals of honor, four gold medals, six silver medals, seven bronze medals, and one honorable mention. It is expected that the exhibit will get still a few more awards."

Wood Preserving Department

BY E. A. STERLING

The Modern Application of Wood Preserving Methods—Various Treatments and the Use of Treated Woods

CHESTNUT, which is the wood featured in this month's issue of AMERICAN FORESTRY, does not figure to any extent in wood preserving practice. It is a timber which is naturally durable, and has long been used for fence posts and other purposes where resistence to decay is an essential quality. Strangely enough, chestnut is one of the most difficult woods to treat by any known preservative method, so it is fortunate that it possesses the inherent power to resist decay. Although the wood is of open nature and the pores in the spring wood are distinct to the naked eye, it is almost impossible to force preservative liquids of any kind for any distance into the wood. This is for the reason that there are cross walls in the pores which are not easily broken down, and which effectively prevent the movement of introduced liquids even under high pressure. While a few chestnut cross-ties are treated at some of the Eastern plants, this species constitutes only a small percentage of even the miscellaneous timbers which are given preservative treatment.

THESE general statements in regard to the preservative treatment of chestnut apply mainly to the large plants which use a pressure process. In the very extensive use of chestnut for telegraph and telephone poles there has been some use made of creosote and carbolineum oils for brush treatment at the ground line. In a few cases an open tank treatment of the base of the pole for about 6 feet has also been given. Although chestnut is naturally durable, the thin sapwood decays quite rapidly in contact with the ground. It is with the aim of checking or preventing this superficial decay that the brush treatment of chestnut poles at the ground line has been practiced. If properly done with a high boiling creosote or coal tar derivative, which will not show too great loss by evaporation, the brush treating of chestnut poles at the ground line is fully justified. By preventing the decay in the sapwood the development of fungus growth, which would ultimately extend into the heartwood, is eliminated.

AN INTERESTING order was received recently by a Chicago firm for shipment to South Africa. It consisted of a cargo of creosoted oak ties for use in building a new railroad. For many years it has been necessary to use metal ties in parts of South Africa on account of the ravages of the white ants. It now seems to be conclusively demonstrated that creosote treatment is an effective protection against these insects. Even with this fact established an order for creosoted ties would hardly be expected in America, and the explanation is that the war has closed the Baltic ports and Europe is now unable to supply creosoted timbers in the African market. Within the past year several cargoes of creosoted Douglas fir ties have been shipped from Pacific Coast points for use in India, and since the average life of a well-creosoted tie properly protected from mechanical wear is about 30 years, it is a natural expec-

tation that a further export market for creosoted American timbers will be found.

THE Santa Fe Railroad is conducting extensive experiments to determine the best methods of eliminating the loosening of spikes in cross ties, and the mechanical wear under the rail or tie plate. Since methods have been perfected which prevent the decay of ties, the next problem is to keep them from wearing out. This is usually done by using large tie plates, and in the more advanced practice holding the tie plate to the tie with lag screws, and using a screw spike as a rail fastener, which is independent of the tie plate. Even with this equipment, ties which are soft in character, as loblolly pine, wear out long before they decay, or fail to give the necessary holding power to the spikes. To overcome this, if possible, the Santa Fe, through the activities of George E. Rex, Manager of Treating Plants, is experimenting with what is known as hardwood "dowels."

These dowels are extensively used in Europe, but are entirely new in the maintenance of way departments of American railroads. They are simply a large wooden plug, bored through the center for the rail spike, and with a wood thread cut on the outside. In the case of old ties from in the spike is loosened the old spike hole is bored out to the proper size, and the hardwood dowel inserted. The rail or plate is then laid on top of the dowels and fastened down, preferably with screw spikes. The result is that a softwood tie becomes essentially a hardwood in respect to wearing qualities. In fact, the result is even better than with hardwood ties, such as oak, because the vertical ends of the grain on the hardwood dowels carry the load, and as is well known through the principle applied in putting creosoted paving blocks on end, the grain of wood in this position is very resistant to wear on breakage. As carried out by the Santa Fe, this can be applied both to old creosoted ties which are taken out and dowels inserted in the old spike holes, and to newly treated ties which are prepared with dowels at the time of treatment. This is an extremely important matter, not only from the standpoint of economy in cross tie maintenance, but also in the conservation of timber resources, because it permits the use under heavy traffic of softwood ties, which otherwise could not be used except under very light traffic. By this practice the forest resources of the south can be more generally utilized.

IN THE promotion of creosoted wood block for city pavements and factory flooring, the question of cost is an important consideration. Although it is generally recognized that wood block is superior to any other form of pavement other materials are frequently used because of their lower first cost. In the effort to correct this condition a new idea in wood block treating practice has been developed independently by two well-known engineers, G. B. Shipley of Pittsburgh, and J. B. Card of Chicago. The essential feature of the new plan is that the blocks are treated in vertical instead of horizontal cylinders. The vertical cylinders are open at the top, and are filled direct with blocks which are carried by conveyor from the wood block machines. By simply dumping in the blocks without the use of cages, as in the case of horizontal cylinders, a greater volume of wood per cubic unit of cylinder displacement can be treated, with the further great advantage that mechanical handling figures entirely throughout the whole process. After treatment the blocks are either dropped direct by gravity to cars through a door in the bottom of the cylinder or pushed out through the top by a piston which operates from the bottom of the cylinder. These vertical plants are very cheap compared with the usual horizontal type, and can be easily erected in connection with saw mill plants or wherever facilities for block treatment are necessary. It is estimated that the saving in the cost of treatment will run from 20 to 25 per cent, which largely removed the handicap of higher cost, which the wood block people have been trying to overcome.

The Fool and Our Forest Dollars

By E. T. Allen

Good-by to the fool with the empty gun;.
  Forgotten his bid for fame.
Though he kills his friend, it only counts one,
  And that, nowadays, is tame.

The fool who playfully rocks the boat
  Is on the front page no more.
He may rank high with the fools afloat
  But his glory is gone ashore.

There's the fool with women, the fool with wine,
  And the fool who games with strangers,
And the joy-ride fool (he does well in his line
  By combining these ancient dangers).

But they're all still down in the primer class,
  Mere novices taking a flyer,
Compared with the prize-taking criminal ass,
  The fool in the woods with fire.

A few hearts break for the deeds they've done
  In their pitiful amateur way,
But fire slays dozens where they slay one
  And scourges a state in a day.

For the ruined home and the smokeless stack
  And the worker unemployed
Know a hundred years shall never bring back
  The things that his match destroyed.

A NEW FACTOR IN FOREST FINANCE

By W. T. Christine.

NEVER before in the history of the lumber industry of America has the question of finance commanded so great a share of the attention of operators.

Conditions have called for continuing increases in plant and timber investments. The unit of value of timber, the price per thousand feet, is steadily advancing. Logging equipment and logging railroads cost more today than formerly. The outcome has created an imperative demand for more working capital.

When this need first became manifest it was met by the issuance of bonds secured by a mortgage on the timber and mill property of the operator.

In many cases the results of the bond issues have not been satisfactory, due to restrictions in operations arising from the conditions imposed by the bond house. This fault may be attributed to the fact that the banker did not understand the necessities of the lumber business, nor its opportunities for profit.

Forest finance is a much deeper and broader question than the people of America have realized. Forestry is practical under present conditions when it is profitable; and then only.

Present day forest finance is extremely practical in character. Money is loaned to owners of timber and mill properties who are worthy of financial aid. Some of these loans are straight mortgages; others are evidenced by bond issues, which likewise are mortgages.

One of the largest transactions of this character placed upon the market this year was the bond issue created and sold by the recently organized James D. Lacey Timber Company, of Chicago. This was a loan of $3,000,000 secured by the property of the Brown Corporation, of Portland, Maine. The Brown Corporation constitutes one of the component companies of the Berlin Mills Company and the Burgess Sulphite Fibre Company, of Berlin, New Hampshire. These companies represent an organization founded in 1852 and purchased by William W. Brown in 1868, since which date they have been in continuous and profitable operation. The three companies today represent an investment of about $30,000,000, with annual sales averaging $12,500,000.

They use their timber economically. If true conservation is the wise and close use of timber, then these companies stand well in the fore rank of the conservationists, with a record of 90 per cent of tree utilization, against the ordinary sawmill record of 35 per cent to 40 per cent.

This bond issue was put on the market and sold at a time when the banking houses of America were disinclined to consider new securities of any kind. The accomplishment was due to the standing of the company offering the bonds and to the further fact that the interests of both maker and buyer were fully protected. It is the ability of the James D. Lacey Timber Company to protect both the bond maker and the buyer that places it in the van of lumber financiers.

James D. Lacey Timber Company is a development of James D. Lacey & Co., a firm which for thirty-five years has been an active force in the purchase, sale, cruising, valuing and development of the timber of North America. The members of this firm also have been active in establishing and operating sawmill and logging enterprises. They understand the needs of the operator, can approximate the credit to which he is entitled and appreciate the latitude that should be given him to make his business profitable. The new organization will have at its command all the wealth of data assembled by James D. Lacey & Co. It would be virtually impossible to duplicate this information as the firm's records cover every timber producing locality in the United States, eastern and western Canada, Mexico, and portions of South America.

When work of this important character is undertaken

OFFICERS OF JAMES D. LACEY AND COMPANY

James D. Lacey, *President*

Wood Beal, *Vice-President and Treasurer.*

Victor Thrane *Vice-President*

by men of experience and proven business acumen a distinctly progressive step is taken. The personal knowledge and influence of the members of the new company, their understanding of the timber and lumber industries, the very high regard in which "Lacey" reports and recommendations are held, renders it possible for the company to perform a genuine service for their clients.

The officers of the company are: President, James D. Lacey; vice-president and treasurer, Wood Beal; vice-president, Victor Thrane; secretary, J. W. McCurdy. The directors include the officers named and Frank D. Stout and Lamont Rowlands, of Chicago, and Charles S. Keith, of Kansas City, Mo. Other stockholders of equal prominence are available for service on the board. The knowledge, experience and ability of the officers and directors of the company, fortified and supported by the reliable and detailed information in their possession, has made possible the success already obtained. The advent of this company should serve to place lumber and timber finance on a much more secure basis.

The facts briefly recited here will make a strong appeal to every forester and to all interested in the subject, for practical forestry means profitable forestry and entails satisfactory methods of finance.

BEAVER DAMS LAST 150 YEARS

HOW long will a beaver dam last? At least a hundred and fifty years is the conclusion of the New York Conservation Commission, as the result of an examination of trees growing upon a very old dam in the vicinity of Eighth Lake in the Fulton Chain.

Scrub white cedars on this dam were cut down, in order to count their annual growth rings, by W. C. Talmage, of Camp Waubun, Seventh Lake, whose study of beavers during the last thirty years has taken him over many of the wild portions of the United States and Canada. A section of one, just received by the Commission, is nine inches in diameter and shows 125 annual rings. Others as large as sixteen inches have rotted in the center until they are mere shells, whose age can only be guessed at.

On the supposition that the trees could not have taken root upon the dam until it had become covered with humus from dead leaves, or silt washed on by the stream, it is believed by the Commission that the dam dates back certainly until 1765, before the power of the Iroquois Confederacy was broken, and when the Adirondacks were still their beaver hunting country of apparently inexhaustible supply. Then every stream held evidence of their skill, and the pelts that they supplied even passed for currency at Fort Orange and New York.

In their old haunts along the Fulton Chain they are coming into their own again, until they have become one of the prime attractions of the region.

WEST VIRGINIA'S STATE FORESTER

BY RECENT action of the legislature of West Virginia the position of State Forester was created, under the Department of the Forest, Game and Fish Warden, and H. J. Kaestner, 4227 Lancaster Ave., West Philadelphia, was appointed.

Mr. Kaestner received his early education in the public schools of Philadelphia, graduating from the Central High School, Course of Commerce, in 1910. His For-

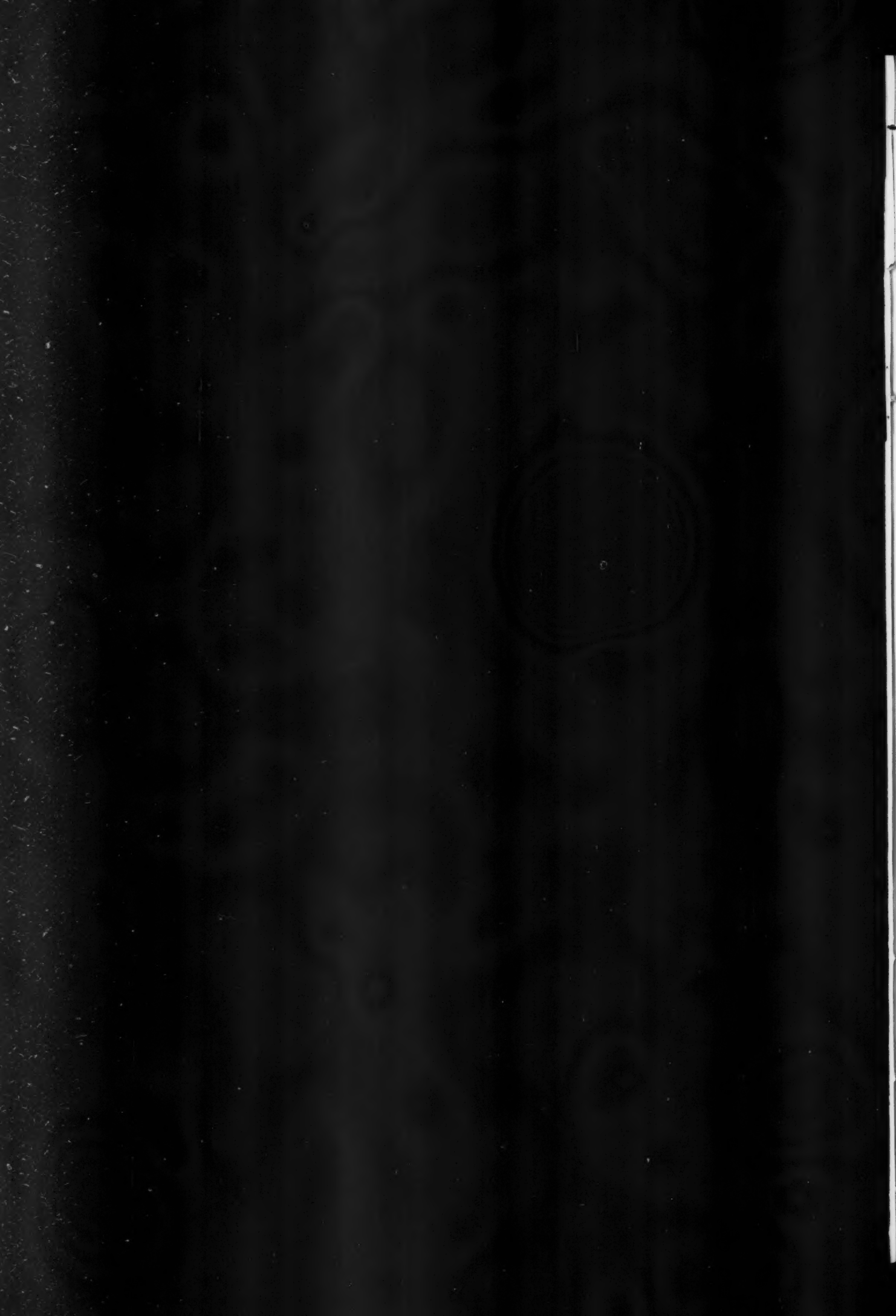
H. J. KAESTNER

The young Philadelphian, a graduate of the Pennsylvania State College Forestry Department, who has been appointed State Forester of West Virginia.

estry work was pursued at the Pennsylvania State College, from which institution he received his degree in 1914.

Mr. Kaestner, both as a student and since graduating, has traveled extensively through the forested regions of the United States. He has seen active service on the Cascade National Forest in Oregon, while extensive trips through New England, the Lake States and the Southern States were made by him in pursuance of his studies while at college.

Headquarters of the Forestry Department are maintained at Belington, W. Va. This department has been conducted under the direction of J. A. Viquesney, State Forest, Game and Fish Warden and it is now assuming the important position in the growth of that State which it so justly deserves. West Virginia, ranking eleventh in lumber production, realizes the importance of its natural resources and the field open to Mr. Kaestner is a large one.



Editorial

NATIONAL FORESTS IN THE EAST

WITH the exhaustion of the remainder of the present appropriation under the Weeks Law, the work of acquiring forest lands by the National Government in the East will be halted until such time as Congress provides means for its continuance. Up to the present time, some 1,250,000 acres have been acquired in the Appalachians and White Mountains. Since the fundamental purpose of these reservations is to protect the headwaters of navigable streams, prevent erosion and regulate flow for navigation and power, it is obvious that these objects will never be satisfactorily obtained until a substantial per cent of the mountainous non-agricultural lands within which these streams have their source are brought under proper management.

The nation has put its shoulder to the wheel at the request and with the sanction of the states concerned, and has selected by thorough examination the areas, seventeen in number, within which it has concentrated its purchases. But in most of these forests the amount of land actually acquired is merely a nucleus for the final goal—a few thousand acres scattered throughout a much larger area, practically all of which must be eventually held in Government ownership if fires are to be controlled and forest cover restored.

Perfect title is demanded before these lands will be accepted by the Government. Many times this condition cannot be fulfilled and friendly condemnation is the only possible solution. The process of appraisal, survey to establish boundaries, examination of title and acceptance of final purchase price by the Purchasing Board and the owner involves delays which greatly hamper the work of acquisition. This work requires expert services and during its progress a force of capable land examiners, surveyors and others has been secured and trained. Active measures of administration and fire protection have been inaugurated on the chosen areas, in some instances with the sanction of the owners, while purchases were pending and before the Government owned a foot of land. The personality of the local supervisors is already making itself felt among the mountaineers and backwoods farmers in an educational campaign against forest fires.

To sum up the situation, everyone, settler, lumberman, town dweller, in the regions affected knows that the work of the Government has only just begun and that to be effective it must be pushed to completion. Those who have suffered inconvenience at the normal delay in purchasing lands have become skeptical of the possibility of doing business with the Government at all. Fire protection on areas not yet owned is being tolerated for the time, but this condition cannot last. There must be a show-down.

If Congress repudiates this great undertaking now, by neglecting to make the necessary appropriations for its continuance, the effect will be much the same as if appropriations for the Panama Canal had been discontinued when the enterprise was half completed. The scaffolding has been erected and the foundations laid. We must proceed with the superstructure.

The nation which is forced to economize by suspending operations on important public works midway of completion is exhibiting financial folly unworthy of a great and prosperous people. Let us proceed without such interruptions along the lines so thoroughly and carefully thought out, to a rehabilitation of our Eastern mountain forests and our Atlantic Coast waterways.

GETTING CLOSER TO FOREST PROBLEMS

FOR the first time since its inception the American Forestry Association will, on October 20, hold a meeting on the Pacific Coast, and the day will be known at the Panama-Pacific Exposition as American Forestry Association Day. This meeting is designed to bring the officials in closer touch with the western conservationists, foresters and lumbermen and to make them better acquainted with the work which the Association is doing all over the country. The members on the Pacific Coast are awaiting the event with keen anticipation and hundreds are expected to attend.

It is the desire of the officials of the association to keep in close touch with the forest problems in every section of the United States. The annual meeting in New York City last January gave a clear insight into the conditions in New York State. The meeting at Boston in January next will be appropriate because it is expected that the question of providing a further appropriation for the operation of the Weeks Law will then be pending. The meeting in San Francisco will be at a time when the fire season in the great Pacific slope forests is practically over and when the reports on the progress of fire protective work will be available. As fire protection is the greatest forest problem on the Pacific Coast it will be possible at the coming meetings in San Francisco for the officials and members of the

association to listen to the reports and participate in the discussions regarding the work of the various fire protective organizations during the season as well as the efforts in the same direction so well made by the United State Forest Service and the State organizations.

During the next year it is the purpose of the Association to get in closer touch with the lumbermen's problems, the greatest of which, as affecting conservation of the forests, is the present need of leaving in the woods to rot, or to burn, some 30 per cent of the annual cut of timber. This 30 per cent, if it was possible to sell it at the price of the lowest grade lumber, would be worth some two hundred million dollars annually. If some market can be found for this great quantity of wood now wasted, if some means of utilization can be developed which would convert it into a merchantable product, then there would be accomplished a saving of practically one third of the annual cut of timber, a saving which would add one third to the present life of our forests.

There are other problems commercial, national, state, municipal and individual which also may be solved in time, and the best means of studying these is to discuss them with people who are trying to solve them, to cooperate with them, and to give them the aid of the big national association, and that is what the officials of the American Forestry Association expect to do.

The Weeks Law Conference

ON THURSDAY, September 23, the American Forestry Association and several co-operating organizations held a conference with Secretary of Agriculture Houston at his office in Washington to present to him reasons why a further appropriation should be secured to carry on the work started five years ago under the provisions of the Weeks Law, and suggested that he urge the importance of such an appropriation upon the President and Congress and recommend it in his annual report to Congress.

Secretary Houston discussed the operation of the law and the proposals to continue the appropriation for the work with members of the delegation from various sections and assured them of his interest in the matter and his very careful consideration of their suggestions.

The presentation to the Secretary of the arguments in favor of the proposition was made by Dr. Henry Sturgis Drinker, president of Lehigh University and president of the American Forestry Association, and was as follows:

September 23, 1915.

To the Hon. David F. Houston,
Secretary of Agriculture,
Washington, D. C.

Sir: The movement for an Appalachian National Forest Reserve originated in the South in 1899 on account of the damage done to the mountain slopes by unwise timber cutting and tillage and by forest fires. Congress was memorialized in the matter in 1900 and many bills have been introduced. (For a summary of the bills and reports between 1900 and 1907 see Senate Report 459, 60th Congress, 1st Session.) The White Mountain project was taken up in 1901 and the two movements combined in 1903. Twice bills passed the Senate only to fail of consideration in the House. In 1907 an appropriation of $25,000 was made for an investigation and report by the Secretary of Agriculture. The Secretary's report, submitted in December, 1907 (Senate Document 91, 1st Session, 60th Congress), recommended the purchase of large areas of lands in the Southern Appalachians and in the White Mountains. Finally in 1911 (see circular on the purchase of land under the Weeks Law), the necessary legislation was secured and an appropriation of eleven million dollars was made for the purchase of land, of which only approximately only $8,000,000 actually became available.

This legislation was secured only after the most earnest efforts of the American Forestry Association and of other organizations represented at this conference. Many hearings were held by congressional committees which were attended by large numbers of representative citizens from the North and the South. The published reports of the hearings and reports of congressional committees show how broadly and thoroughly the question was considered. Many phases of the problem were discussed in publications of the Forest Service and Geological Survey. Action was taken by Congress only after all the bearings of the proposed legislation had been fully considered, and with the full knowledge that if the plan succeeded further appropriations would have to be made to carry the work to completion.

It is now reported by the United States Forester that of the $8,000,000 that actually became available under the Weeks Law, all except some $500,000 has been spent. There have been acquired or approved for purchase 1,285,000 acres at an average price of $5.25 per acre. Including cost of appraisals, surveys and title investigation work, the cost has been $5.83 per acre. Purchases have been limited at first, as we believe wisely, to the Southern Appalachian and the White Mountain regions. Considering only these regions, the program first proposed by the Secretary of Agriculture in 1907 (Senate Document 91, 1st Session, 61st Congress, and laid down by the National Forest Reservation Commission in its last annual report (Senate Document 661, 3rd Session, 61st Congress), is now far from complete in these regions. In some areas (already designated for purchase) no acquisitions have so far been made, and some localities ought to be included in purchase areas that are not now included. The Weeks Law is not limited to particular states or regions. It is, as it should be, a broadly national bill. Lands ought to be acquired to some extent outside the Appalachian region, as, for instance, in Arkansas and other western states to round out and complete the present National Forests for the purpose of protecting the watersheds of navigable streams.

An excellent beginning has been made on a great construction program that the Federal Government must carry to completion if the interests of the nation are not to suffer. The organizations represented here have long

been fully convinced of the wisdom and necessity of this program. Some of them labored for years for its inauguration. They have watched with deep interest and gratification the results secured under the Weeks Law, and their representatives are here now to assure the Secretary of Agriculture of their continued interest and to urge that the program be carried forward without interruption and on a scale commensurate with its importance. A further object of the conference is to consider ways and means of working effectively towards that end.

As the officer of the Government most largely responsible under the law for carrying forward this program, we desire to suggest to the Secretary of Agriculture that if it meets with his approval he urge upon the President and Congress the importance of this program and a continuation of the appropriation of funds necessary to carry it on. Our hope is that the Secretary may discuss the matter in his annual report and recommend a continuation of appropriations, as recommended by the National Forest Reservation Commission in its annual report, at the rate of $2,000,000 a year for an additional period of five years and also that he will include in his estimates to Congress for the fiscal year 1917 an item of $2,000,000 as a first installment of this appropriation.

The program of purchases should go on without interruption for the following principal reasons:

1. Congress has begun the policy. It did so only after long consideration and discussion and after obtaining convincing proof of its necessity. Under the authority obtained, and the appropriations, a good start has been made. An effective procedure has been worked out. A force of experts has been trained. The machine which has been created for the work and which under the law is somewhat complicated is in motion.

2. It would be a great loss to have the program interrupted. The force which it took two or three years at the start to get together and train would be lost so that when the work is taken up again a new force would have to be gotten together and trained. Touch would be lost with the land owners, and with it that intimate information as to titles, surveys and values which is now making the work go forward effectively.

3. The wisdom of the Secretary of Agriculture has been shown in limiting at the start purchases to certain specific areas of great importance. But the purchases are not complete in any of these areas and undoubtedly cannot be made so with the appropriation already made. If the purchases should stop now the Government would be put to too high a cost for protecting and administering its lands on account of intervening private lands. Furthermore, the work would not have gone far enough to accomplish the purpose which the legislation was intended to accomplish.

4. This program is of too great importance to be carried on intermittently. It is of the utmost national importance that the mountain watersheds be protected so that the streams may be capable of the highest development; so that the soils shall not be washed from the mountain sides nor the property of persons or communities ruined or damaged by floods which could in part be restrained; so that the river valley soils may not be destroyed as a result of the floods and débris from the mountains.

5. Finally, the continuation of this program is urged as a matter of economy. It is believed that it will cost less to carry it on than not to do so. Carried on it will mean an expenditure of $2,000,000 per year, with some three or four hundred thousand acres of mountain timber lands passing each year into the hands of the Government to be developed for timber production and to be utilized in many useful ways by the public. In this case at any time in the future the property will be worth more than the cost. If the program is not carried on the result will be the certain deterioration of these lands by fire and by unwise timber-cutting and tillage, the loss of at least a portion of the soils and likewise a loss in the navigability, power possibilities, and purity of the streams, increasing damage by floods to cities, communities, and persons along the rivers, and also to river valley soils. And after all this loss has been sustained (and it will certainly amount to more than the cost of these lands), the necessity will still exist for the Federal Government to handle the situation, and the cost of doing so then will be greater than it is now.

Members of the delegation at a meeting after the conference appointed as a committee to direct the activities of the co-operating organizations toward securing the desired appropriation the following: Dr. Henry Sturgis S. Drinker, president of the American Forestry Association; Percival Sheldon Ridsdale, secretary of the American Forestry Association, and Philip W. Ayres, forester of the Society for the Protection of New Hampshire Forests, and gave the committee power to appoint others to assist in the work.

The organizations represented and the delegates attending were:

The American Forestry Association, Washington, D. C., Dr. Henry S. Drinker, president, and president of Lehigh University, South Bethlehem, Pennsylvania, and P. S. Ridsdale, executive secretary, of Washington.

Massachusetts Forestry Association, Boston, Mass., Harris A. Reynolds, secretary, and Allen Chamberlain, of Boston.

Society for the Protection of New Hampshire Forests, Boston, Mass., Philip W. Ayres, forester.

North Carolina Forestry Association, Chapel Hill, N. C., Hugh MacRae, Wilmington, N. C.

Appalachian Mountain Club, Boston, Mass., Hon. Harvey N. Shepard, of Boston.

Appalachian Park Association, Asheville, N. C., George S. Powell, secretary.

Knoxville Board of Commerce, Knoxville, Tenn., W. M. Goodman, Knoxville.

New Hampshire State Board of Trade, Concord, N. H., Geo. B. Leighton, Dublin, of the State Forestry Commission.

Western New England Chamber of Commerce, Springfield, Mass., Frank M. West, of Springfield, Mass.

Pennsylvania Forestry Association, Philadelphia, Pa., Herbert Welsh, Philadelphia.

Connecticut Valley Waterways, Association, Springfield, Mass., Ashton E. Hemphill, Holyoke, Mass.

Southern Commercial Congress, Washington, D. C., Dr. Clarence J. Owens, managing director, Washington, D. C.

New Haven Chamber of Commerce, by Charles E. Jolin, New Haven, Conn.

Bouquets for the New Magazine

The change in style and size of AMERICAN FORESTRY has been welcomed by words of hearty commendation by members of the American Forestry Association. They have expressed their admiration of the colored cover, the better illustrations and the whole very marked improvement in words which leave us no doubt as to the wisdom of making the change.

Some of the comments follow:

"Let me heartily congratulate you on the continued and steady advance of our magazine in beauty and interest."
DR. H. S. DRINKER,
President of Lehigh University, South Bethlehem, Pa.

"I have just received and looked over the August issue of AMERICAN FORESTRY, and I am really surprised at and very favorably impressed by the change. I think it will attract much attention and increase the prestige of the magazine and of the Association. I am gratified to see the large amount of advertising and hope it will be sustained."
CHESTER W. LYMAN,
International Paper Company, New York City.

"I congratulate you upon the new form of the magazine. The interesting part is to look back about three years and trace the evolution and improvement. You have unquestionably done wonders in creating an attractive magazine, and I am convinced that if more people saw it and more readers knew about it they would take it for its own sake alone, regardless of any sentiment, propaganda or charitable feeling towards the Association."
E. A. STERLING,
Manager, Trade Extension Dept., National Lumber Manufacturers' Association, Chicago, Ill.

"Congratulations on the good taste of the new clothes worn by AMERICAN FORESTRY. 'Clothes bespeak the man,' and the quality, character, as well as the appearance of the magazine have never before spoken so well as now. I now feel that constructive American forestry is ably represented and well dressed."
CHARLES LATHROP PACK,
Lakewood, N. J.

"I wish to compliment you on the August number of AMERICAN FORESTRY—the magazine is surely greatly improved."
PROF. R. B. MILLER,
Dept. of Forestry, University of New Brunswick, Fredericton, N. B.

"I congratulate you on the favorable impression which the magazine in its new form has made. I continue to think that the preservation of forests is one of the chief features of wise national conservation."
DR. CHARLES W. ELIOT,
Cambridge, Mass.

"Congratulations on the new form and increased size of your valuable publication. May it be a means of carrying on more and more effectively the good work you are doing."
GEORGE H. RHODES,
Secretary, California Forest Protective Assn., San Francisco, California.

"While I have this opportunity, allow me to congratulate you on the attractive appearance of the August number. It seems to me that this new size should allow of even better illustrating than ever before, and should contribute to the popularity of the magazine."
J. GORDON DORRANCE,
Baltimore, Md.

"It is with pleasure that I compliment you upon the new size of the magazine, which permits of greater picture space directly by the reading matter, thus holding the reader's attention more closely. The article on Yellow Poplar is splendid."
H. J. KAESTNER,
State Forester, Belington, W. Va.

"I liked the appearance of the last issue of AMERICAN FORESTRY very much. The new shape strikes me much more favorably than I had anticipated."
S. T. DANA,
Washington, D. C.

"I think the August number of AMERICAN FORESTRY is a remarkable improvement, even upon the greatly improved issues that have gone before. The colored cover makes a striking impression and I predict for the Association a rapid increase in membership as a result."
M. B. BURBAGE,
Germantown, Pa.

"Allow me to congratulate you on the large size and attractive appearance of your August edition. As we are all more or less picture lovers, that feature brought more intimately to one's notice I think will be a continued advantage."
W. R. BROWN,
Berlin, N. H.

"Allow me to present my sincere compliments upon the August issue of AMERICAN FORESTRY,—upon its very artistic appearance and its very solid, fine substance—a combination rarely met."
MARGARET L. STREETER,
Washington, D. C.

"AMERICAN FORESTRY, the magazine of the American Forestry Association, comes out in a brand new dress. The design of the front cover is attractive, being a photograph in colors of the tulip or yellow poplar tree, whose characteristics and commercial uses receive special attention in this number."
LUMBER WORLD REVIEW,
Chicago, Illinois.

"AMERICAN FORESTRY has made its appearance in a new, enlarged form, beginning with the issue for August. The cover is in colors and is ornamented with a photograph of a magnificent tulip tree, otherwise known as the yellow poplar, with beautiful reproductions of the flowers as panels, the latter being evidently engraved from an artist's sketch. The magazine has been increased in dimensions, the page now measuring 9x12 inches, as compared with the former size of 6¾x10 inches. AMERICAN FORESTRY is the organ of the American Forestry Association and is a most creditable publication."
"PAPER,"
New York City.

"My congratulations on the enlarged magazine. I dare to believe that it will fill the place long hoped for it in this new form."
PHILIP W. AYRES,
Forester, Society for the Protection of N. H. Forests, Boston, Mass.

"The appearance of the August issue of AMERICAN FORESTRY certainly entitles you to the congratulation of your friends and of its friends. When it reached me I opened it in surprise. It was almost stunning. Keep on this way, everlastingly, and especially along that educational trail at which you hint, for nothing more helpful or hopeful for forestry can be thought of."
DR. J. T. ROTHROCK,
West Chester, Pa.

"Please permit me to remark that the magazine is much more attractive and that in my humble opinion its new form should do a great deal toward increasing its popularity, more especially among people who are not directly or intimately concerned with the science of forestry."
T. H. SIMPSON,
Washington, D. C.

"The AMERICAN FORESTRY for August, in my opinion, is the most beautiful magazine that has yet graced a newsstand, while the leading article about Yellow Poplar, is exceptionally complete, interesting and valuable, ranging as it does from botanical characteristics to the details of timber utilization. A magazine of this character, if it can be given general distribution, will unquestionably be of great value to the lumber industry, and of much interest to the general public."
R. S. KELLOGG,
Secretary, National Lumber Manufacturers' Assn., Chicago, Illinois.

"Your August issue of AMERICAN FORESTRY just received. We think that you have made a wise move in enlarging the size of your publication and want to congratulate you on its general appearance."
C. D. ANDERSON,
Chicago, Ill.

"I like the August issue in every way and think it is bound to fill a much larger field of usefulness. The new form gives it better opportunities for display and makes the pictures an extremely attractive feature. It ought to result in much more interest in, and success for, the organization. . . . All in all, I think it is a corker and you are to be congratulated."
BRISTOW ADAMS,
Cornell University, Ithaca, N. Y.

"The appearance of the August number of AMERICAN FORESTRY is certainly very attractive and shows a marked improvement."
AUSTIN F. HAWES,
State Forester, Burlington, Vt.

"I congratulate you on the fine appearance of the August number. It surely is a beauty, and I think that you are doing marvelous work in spreading real interest in trees, and we are all the more pleased with this because we recognize that this work is an important part of nature study."
EDWARD F. BIGELOW,
Editor, The Guide to Nature, Sound Beach, Connecticut.

"The new magazine is much more attractive, and I believe is a great improvement over the old one in every way. It ought to impress people and to aid in securing new members. I congratulate you on it."
PROF. H. H. CHAPMAN,
Yale Forest School, New Haven, Connecticut.

A Valuable Study

During the months of July and August the New York State College of Forestry at Syracuse University studied the forest growth and local wood market conditions in Broome County, New York. This work was done in the towns of Maine, Union and Vestal by Harold M. Day, a graduate student in the College of Forestry. Mr. Day estimated the amount of cordwood in each woodlot and mapped all areas down to 10 acres in extent on carefully prepared maps. At the same time Mr. Day made a comprehensive study of the portable milling industry in this section. This data will be written up in form of a report and with this information at hand in bulletin form the marketing of forest products will be a much simpler matter than it is today.

A 750,000 Acre Elimination

The President, on recommendation of Secretary Lane, recently eliminated about 750,000 acres of land from the Cleveland National Forest, California. The unwithdrawn lands will be subject to settlement only under the homestead laws beginning 9 a .m., November 2, until and including November 29, 1915, after which they will be subject to be taken up under the laws applicable thereto. The lands, which are rolling in character and covered mainly with chaparral, lie along the boundaries of the National Forest in Riverside and San Diego Counties in southern California, within the Los Angeles land district, and about 333,000 acres thereof are public lands and subject to entry.

The Longleaf Pine Picture

Acknowledgment is made to *The Southern Lumberman*, of Nashville, Tenn., for the privilege of using the photograph of the longleaf yellow pine stand from which the handsome colored picture on the cover of the September AMERICAN FORESTRY was made. This photograph was selected for coloring from a large number, being considered one of the finest photographs of a yellow pine stand in existence.

Wins a Diploma

The New York State College of Forestry at Syracuse prepared last year a small exhibit showing forest conditions and forest work in the State of New York for the Panama-Pacific Exposition at San Francisco. The college has just received word that it has been awarded a diploma for the educational value of its exhibits. The diploma will come to the college through the Bureau of Education at Washington as its exhibits were judged as a part of the general educational exhibits at the Exposition.

Canadian Department

BY ELLWOOD WILSON

Secretary, Canadian Society of Forest Engineers

Probably the most important move along forestry lines in Canada during the past month has been the decision of the Government of the Province of New Brunswick to appoint a Provincial Forester and to commence a forest survey and estimate of the resources of that Province. This Province has hitherto been behind the times in this most important particular and the change in policy will be warmly welcomed by all friends of conservation. There are about eight million acres of forest lands held by the Government and lumbering is one of the most important industries of the Province. Although immense quantities of timber have been destroyed by fire, there is still enough, if properly cared for, to give the lumber industry a firm foundation for all time.

There is practically no accurate knowledge of areas burnt, of barren land or of merchantable timber, and the last Legislature voted the sum of $50,000 to be spent this year in getting at the facts. Lately the Premier, the Hon. Mr. Clarke, and the Provincial Treasurer, Dr. Landry, have made a trip to Quebec and Ontario, collecting information which would be valuable in inaugurating the new policy and in looking around for the right man for Forester.

Classification of its lands will enable the Government to open up lands for settlement intelligently and will prevent many of the disastrous mistakes made in this matter by other Provinces. Later some scheme of reforestation will be considered. The only work now being done along that line in New Brunswick is that of the Pejepscot Paper Co. at Salmon River.

The Chief Forester of Quebec has prepared a very comprehensive scheme for the exploration of lands and their classification, and forms for reports have been elaborated with much detail.

Several of the Canadian railways have equipped tank cars for fighting forest fires along their rights-of-way. The Canadian Pacific has two such cars at Brownsville, Me., the Grand Trunk has one in the Algonquin National Park and the National Transcontinental one between Edmundston, N. B., and Quebec. This latter road is considering equipping two more of these cars for use between Quebec City and the Ontario boundary, and it is hoped will be decided on. These have a capacity of about ten thousand gallons and will throw a stream of water five hundred feet from the track.

During the past month, Messrs. Clyde Leavitt, G. C. Piche, Robson Black, Henry Sorgius, and Ellwood Wilson made two very interesting trips. The first of these was to the Quebec Government plantation at Lachute, on the sand dunes, and its nursery and experimental station at Berthierville. About fifty years ago the careless handling of sandy lands by farmers allowed the sands to begin to drift and in a few years such a large area was covered and rendered unfit for cultivation. Spasmodic efforts were made by the farmers to prevent the spread of the sands by planting trees and sowing different kinds of grass, but as there was no co-operation and no comprehensive scheme the effort was abortive. A few years ago the Quebec Government recognized the danger and bought up about 350 acres of these lands at one dollar per acre, giving the vendors the right to buy back the lands at the end of fifteen years at $10 per acre, but with no right to cut the timber. The neighborhood is exceptionally favorable for tree growth of all kinds, as, although the soil is pure sand, the water table is high and there seems to be abundant moisture. Four years ago the plantations were commenced, several sorts of trees being used, white and Norway spruce, larch, white and Scotch pine, and green ash. About 1,500 trees per acre were planted, the work being done by the students from the Government Forest School. Sixty per cent of these trees have survived and some show surprising growth; one spruce showed a leader thirty-one inches long. After this first planting it was decided to establish beach grass before planting trees, and this was done by plowing furrows and laying in them heads of this grass. The grass is taking a good hold and trees will be planted between the rows and will in time kill out the grass. These lands will soon be covered with a very valuable crop of timber and will encourage the planting of other areas of a similar character which exist in the Province.

At the Experiment Station at Berthierville a mixed stand of white pine and maple was examined. This stand has been carefully thinned and the reproduction of white pine is really remarkable, the young trees springing up almost like a carpet. The seed and transplant beds of all the different sorts of trees which can be grown in this region are doing very well and the demand for trees is rapidly growing.

The other trip was made into the woods to look over some experiments in brush disposal made by the Laurentide Company some two years ago. Tops of trees left after logging were lopped and left in as close contact as possible with the ground, and it was found that such brush was moister and had more progress toward decay than where the tops had not been lopped. This advantage was, however,

overbalanced by the fact that the brush covered more ground and so hindered reproduction. It is doubtful if top-lopping pays either from the standpoint of fire protection or that of reproduction, and it seems as if piling and burning was the only solution of the problem.

On the 24th of August, Mr. F. Laliberté, manager of the firm of Laliberté & Marquis, died in Quebec after an operation for appendicitis. Mr. Laliberté was a graduate of the Laval Forest School and worked from 1912 to 1913 with the Quebec Forest Service, which he left to organize the above firm, which carried on the business of forest engineering and also handled timber, recently shipping poplar to South Africa. He was only 28 years of age and showed much promise.

Mr. Henri Roy, graduate of the Laval Forest School and for some years in charge of the Quebec Government Nursery at Berthierville and now Forest Agent, has been elected an active member of the Canadian Society of Forest Engineers. Mr. E. S. Holloway, Acting Chief Engineer of the Canada and Gulf Terminal Railway and Member of the Canadian Society of Civil Engineers, has been elected an associate member.

Mr. R. L. Campbell has resigned the editorship of the *Pulp and Paper Magazine of Canada* to become the Secretary of the Canadian Pulp and Paper Association.

A farmer at Lac Ignace, Quebec, was arrested for setting fire to his clearing without a permit and fined ten dollars and costs, amounting to $100.00 in all. This is the second conviction for such an offense before a magistrate and shows that the justices of the peace have awakened to the necessity of enforcing the forest fire laws. Eight or ten other arrests have been made, and it will not be long before the farmers realize the necessity of care. Agents of the Government and of the Forest Protective Associations are traveling through the country trying to educate the people and enlighten them as to their responsibilities, and arrests are only made of flagrant cases.

According to the annual report of the Dominion Forestry Director, the herd of fifty reindeer purchased by the Government from Dr. Grenfell has now been reduced to four animals, all females, and it is proposed to try and cross these with the native caribou. The great difficulty has been with the bulldog flies in the summer. These attack the deer and irritate them to such an extent that they break out of their corral and scatter into the bush. The herds of wood bison, on the other hand, seem to be increasing and now number probably five hundred head. They are well protected and should increase rapidly.

In the Forest Reserves in Saskatchewan the Government has required brush piling and burning on all timber sales, and while there was a little opposition at first, this was soon overcome and now it is a regular procedure. Mr. Gutches, lately in charge of this work, gives the following figures of costs: With wages at 25 cents per hour the average cost per acre was $1.00, average cost per cord five cents, average cost per thousand feet board measure ten cents. On another operation, where 16,178 ties were made but the lopping was not done till after all the ties had been removed, the cost for lopping and burning was one cent per tie or 31 cents per thousand feet. This cost would have been much less had the lopping and burning been done at the time of cutting. Brush burning should certainly be made a routine part of every logging operation.

The first number of the first forestry journal published in Spain has just appeared, under the title of *Espana Forestal*. It is edited by Sr. Don R. Cordoniu and published monthly at fifteen pesatas the year. Sr. Cordoniu is a member of the Spanish Forestry Association, The Royal Spanish Society of the Friends of the Tree, and has been for many years in charge of the control of torrents and reforestation of the mountains and planting to control sand dunes. He is also a noted Esperantist.

British Columbia Notes

Maps showing the range of each commercial timber species in the Province have been completed. Necessary information for these maps was obtained from reconnaissance parties, cruisers and other members of the field force. While minor corrections will undoubtedly have to be made from time to time as a result of future and more detailed observations, it is thought that the general range of the various species has been fixed with a fair degree of accuracy.

The Hon. W. R. Ross, Minister of Lands, in a recent interview expressed great satisfaction at the result of three months' work in connection with the markets campaign, in the course of which seven cargoes, representing over twenty million feet of lumber, have been sold to the British Government. This will have been the means of circulating a sum in the neighborhood of a quarter of a million dollars, the bulk of which is made up of wages, supplies and transportation and has caused much activity in the lumber industry.

The pulp mills at Powell River have recently increased their output to the maximum capacity, and two hundred extra men have been taken on in consequence. With the prospect of an early resumption of work at Ocean Falls, the pulp output will be further increased, and as soon as additional tonnage can be secured activity in the pulp industry should be still more pronounced.

A chart has been prepared in the Victoria office for use at headquarters, showing the daily maximum and minimum temperatures reported by each weather recording station, by means of horizontal curves, and the rainfall by perpendicular proportional lines. The Dominion Meteorological Service furnishes daily reports for this purpose in addition to giving special forecasts whenever the fire hazard becomes serious. Such a chart is of the utmost value in enabling close touch to be kept with the fire situation throughout the Province and is a useful addition to the weekly telegraphic advices sent in by the District foresters.

Rangers M. V. Allen and F. B. Edwards, of the Canadian Mounted Rifles, are at Shorncliffe.

The end of the first week in August found the fire situation very hopeful. There had been no losses to speak of in green timber and the fire-fighting expenditure compared favorably with last year. The rainfall throughout the season has been above the normal and some rain may be looked for during August, which is the critical month of the year. In some districts the absence of hazards enabled much improvement work to be undertaken by the forest wardens. Storms and slash fires caused serious damage to the 65-mile telephone line connecting the logging camps on the islands between the mainland and Vancouver Island and necessitated heavy repairs. The submarine cables on this line have given entirely satisfactory service and the line fulfils a most useful purpose. Numerous outbreaks of fire during the second week in August gave considerable trouble in the Vancouver district, which takes in much of the coast, and much damage was caused to property. The fires were due to lighting in many cases and many were ascribed to campers. One life was lost and much property destroyed.

V. K. Wood, clerk, who left Victoria with the 48th Batt., is at Shorncliffe.

Forest Assistant O. J. Sangar, of the Lillooet Division, has volunteered for active service and hopes to leave for England with his battalion.

Forest Assistant E. G. MacDougall has left for England with one of the Eastern Canadian regiments, preferring to go in the ranks rather than wait for a commission.

H. R. MacMillan, Special Trade Commissioner, after visiting the United Kingdom, France and Italy, is on his way to South Africa.

Interesting accounts of trench fighting in Belgium came from Ranger Turnbull, of the Princess Patricia's Light Infantry. No word has been received from Ranger Brewer, Forest Assistant Pickup, Draughtsman Stone, Scaler Milroy and other of the B. C. Forest Service now at the front.

James Eddie, clerk, has been wounded and is in the hospital, with the prospect of remaining there for several weeks, suffering from a compound fracture.

Assistant Forester H. K. Robinson, who holds a commission in the 5th Regiment, Royal Canadian Artillery, is leaving for the front in charge of a detachment provided by that regiment for active service.

Forest Assistant F. McVickar, of the Royal Canadian Dragoons, who has been in the trenches for several months, is now in England recovering from sickness.

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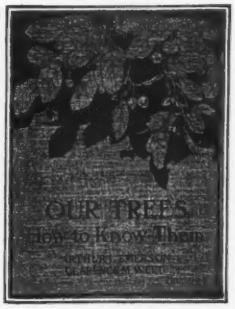

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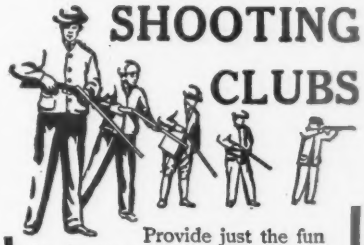

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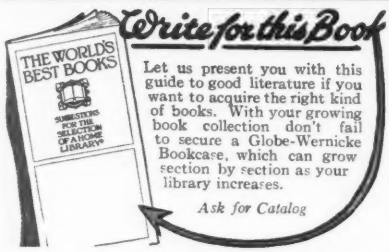

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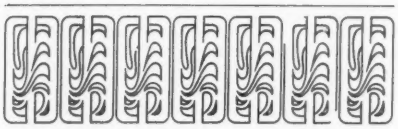

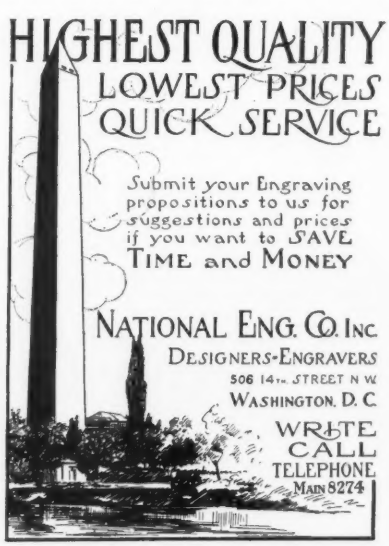

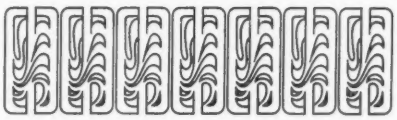

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